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DISTRIBUTION SHEET To From Page 1 of 1Distribution DST Project & Maintenance Eng. Date 8 Sept 2005 Project Title/Work Order **EDT No.** 822001 Ultrasonic Inspection Results for Double-Shell Tank 241-AN-104 - FY 2005 ECN No. N/A Text Attach./ EDT/ECN Name MSIN With All Text Only Appendix Only Attach. Önly RP Anantatmula R1-14 Χ JL Castleberry R3-26 Χ VL Callahan H6-60 Χ GP Duncan R3-26 Χ S5-07 BK Everett Χ TL Faust S5-03 Χ LJ Julyk R1-14 Χ R1-51 PC Miller Х MJ Ostrom S5-07 Χ S5-07 TC Oten Χ RL Schlosser R1 - 14Χ S5-10 BH Thacker Χ R1-14 TC Mackey Χ MA Hag S5-07 Χ

ULTRASONIC INSPECTION RESULTS FOR DOUBLE-SHELL TANK 241-AN-104 - FY 2005

CHRIS E. JENSEN

CH2M HILL HANFORD GROUP, INC.

Richland, WA 99352

U.S. Department of Energy Contract DE-AC27-99RL14047

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Abstract: This report documents the ultrasonic examination of DST 241-AN-104. There were no reportable indications of wall thinning, pitting or cracking in the plates. The greatest thinning was 2.2% or 0. 011 inches in Plate 3 (0.5 inch nominal). There were no reportable cracking, pitting or thinning indications in the weld heat affected zones examined. The greatest thinning in the weld heat affected zone was 7.4% or 0.037 inches in the vertical weld in Plate 3.

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ULTRASONIC INSPECTION RESULTS FOR DOUBLE-SHELL TANK 241-AN-104 – FY 2005

C.E. Jensen

CH2M HILL Hanford Group, Inc.

Date Published September 2005



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Ultrasonic Inspection Results for Double-Shell Tank 241-AN-104 – FY 2005

September 2005

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Prepared for:

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	TERMS	
A A ТТ	Absolute Amiusl Time Technique	
AATT ASME	Absolute Arrival Time Technique American Society of Mechanical Engineers	
CH2M HILL	CH2M HILL Hanford Group, Inc.	
CHAMPS	Computerized History and Maintenance Planning System	
COGEMA Engineering	COGEMA Engineering Corporation	
dB	Decibel	
DSC	Distance Sensitivity Calibration	
DST	Double-shell tank	
DSTIP	Double-Shell Tank Integrity Project	
EPRI	Electric Power Research Institute	
FSH	Full Screen Height	
FY	Fiscal Year	
HAZ	Heat-Affected Zone	
IIW	International Institute of Welding	
MHz	Megahertz	
NDE	Nondestructive Examination	
PDT	Performance Demonstration Test	
PNNL	Pacific Northwest National Laboratory	
RATT	Relative Arrival Time Technique	
RL	U.S. Department of Energy, Richland Operations Office	
RMS	Root Mean Square	
T-SAFT	Tandem Synthetic Aperture Focusing Technique	
TWINS	Tank Waste Information Network System	
TWRS	Tank Waste Remediation System	
UT	Ultrasonic Testing	
WDOE	Washington State Department of Ecology	

EXECUTIVE SUMMARY

Background

Through FY 1999, six double-shell tanks were ultrasonically examined to meet the integrity requirements of the *Washington Administrative Code*, Chapter 173-303, "Dangerous Waste Regulations". Subsequent to the examinations, integrity assessment reports were issued for each double-shell tank farm and submitted to the Washington State Department of Ecology (WDOE) in FY 1999. In June 2000, the Washington State Department of Ecology issued Administrative Orders 00NWPKW-1250 and 00NWPKW-1251 providing prescriptive examination requirements for all double-shell tanks by FY 2005. In 2003, the Administrative Orders were incorporated into the Hanford Federal Facility Agreement and Consent Order, Milestones Series M-48. Milestone M-48-13 requires examination by September 30, 2005, of four DSTs not previously examined. This report documents the required ultrasonic examination of double-shell tank 241-AN-104, completed in the fourth quarter of FY 2005.

Methodology

The primary tank wall examinations consisted of two parallel 15 to 17-inch wide strips, ~33 feet in length (scanned vertically), a horizontal 17 inch by 240 inch strip encompassing the historical liquid-air interface. The primary wall vertical examinations were looking for wall thinning, cracking, and pitting in the tank wall. The weld heat affected zones (HAZ) examined included 25.1 linear feet of vertical welds joining plates 2 through plate 5, and ~21 linear feet of the horizontal plate #5 to knuckle weld (see figure 10-1). The primary tank lower knuckle and four air slots were examined using the P-scan system.

The ultrasonic examinations were carried out in accordance with American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section V, "Nondestructive Examinations". The personnel and non-destructive examination equipment were qualified to perform the examinations on the double-shell tanks by performance demonstration tests (PDT) administered by Pacific Northwest National Laboratories.

The accuracy of the PDT measurements was required to be within 0.020 inches for wall thinning, 0.050 inches for pitting, and 0.10 inches for cracking (per RPP-22571 Engineering Task Plan for the Ultrasonic Inspection of Hanford Double-Shell Tanks - FY2005, Jensen 2005). The PDT revealed that the examiners met this requirement (section 6.0).

Results

There was no reportable wall thinning detected in any of the plate areas examined (reportable wall thinning is defined as greater than 10% below nominal). The primary wall vertical scans yielded an overall average ((scan 1 + scan 2)/2) wall thickness value of 104% of nominal. The overall average ((scan 1 + scan 2)/2) minimum wall thickness value was 99.6% of nominal. Of

the 12 inch long vertical wall plate scans yielding minimum thicknesses falling below the nominal values, the greatest deviation was 2.2% below the nominal (Plate #3, Scan 1). There were no reportable pitting indications nor any crack-like indications detected in any of the wall plates.

There were no areas of reportable wall thinning, cracking, or pit-like indications detected during the primary tank horizontal wall scan of the historical liquid-air interface.

The average horizontal wall thickness value was 106.7% of nominal for the liquid-air interface scan. The average minimum horizontal wall thickness value was 101.2% of nominal. Of the 12 inch long horizontal wall plate scans yielding minimum thicknesses falling below the nominal value (0.500 inches), the greatest deviation was 0.4% below the nominal.

There were no areas of reportable wall thinning, no crack-like indications, nor reportable pitting indications detected in any of the weld HAZ. This included the primary tank vertical weld scans, and the primary tank lower knuckle-to-shell horizontal weld scan. The average HAZ thickness value was 102.9% of nominal for the vertical weld HAZ, and 104.7% of nominal for the horizontal knuckle/plate weld HAZ. The average minimum HAZ thickness value detected was 97.1% of nominal for the vertical welds HAZ, and 101.3% of nominal for the horizontal weld HAZ. Of the 12 inch long HAZ scans yielding minimum thicknesses falling below the nominal values, the greatest deviation was 7.4% below nominal for the vertical welds HAZ, and 2.6% of nominal for the horizontal weld HAZ.

The examination of the primary tank lower knuckle revealed no areas of reportable thinning, pitting, or crack-like indications. The knuckle examination included a horizontal strip of the knuckle wall, and four vertical strips of the wall aligned with four different air slots. The average wall thickness detected was 108.1% of nominal for the horizontal scan, and 110.9% of nominal for the vertical scans. The average minimum wall thickness detected was 103.7% of nominal for the horizontal scan, and 109% of nominal for the vertical scans.

All of the areas of the knuckle that were examined had minimum thicknesses that exceeded the nominal thickness of 0.875 inches.

Conclusions

Based on the results of this examination (no reportable indications), the material condition of DST 241-AN-104 is satisfactory for continued operation.

The tanks inspected to date are summarized in the following table.

Double-Shell Tanks Inspected Through August 2005

Double- Shell	Inspection Year (FY)										
Tank	1997	1998	1999	2000	2001	2002	2003	2004	2005		
AN-101				1_		х					
AN-102					х						
AN-103									х		
AN-104									х		
AN-105			х			(1)					
AN-106			х								
AN-107		х							<u> </u>		
AP-101							X (3)				
AP-102	•								х		
AP-103							X (4)				
AP-104								Х	(1)		
AP-105							х				
AP-106									х		
AP-107				х							
AP-108				х		(2)					
AW-101					х						
AW-102						х	(5)				
AW-103	х										
AW-104						х	,				
AW-105					х						
AW-106						х					
AY-101					х	х	(1)				
AY-102			х						I		
AZ-101			х								
AZ-102							X (3)				
SY-101								х			
SY-102								х			
SY-103								х			

⁽¹⁾ Limited scope reexamination.

⁽²⁾ Linear indication evaluated.

⁽³⁾ Includes primary knuckle Synthetic Aperture Focusing Technique (T-SAFT) examination.

⁽⁴⁾ Linear indication detected; A follow-up inspection determined that it is a small area of incomplete fusion.

⁽⁵⁾ Primary knuckle T-SAFT examination only.

1.0 INTRODUCTION

In May 1996 the Tank Waste Remediation System (TWRS) Decision Board recommended, and U.S. Department of Energy, Richland Operations Office (RL) agreed, that the condition of the double-shell tanks (DST) should be determined by ultrasonic testing (UT) inspection of a limited area in six of the 28 DSTs (Figure 1-1). The Washington State Department of Ecology (WDOE) agreed with the strategy of limited ultrasonic inspection of DSTs. Data collected during the UT inspections will be used to assess the condition of the tank, judge the effects of past corrosion control practices, and satisfy a regulatory requirement to periodically assess the integrity of waste tanks.

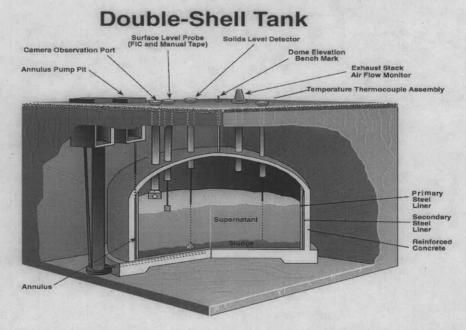


Figure 1-1. Typical Double-Shell Tank Configuration

In November 1996, DST 241-AW-103 was the first tank inspected to determine if Hanford DST walls could be inspected without removing the existing surface rust and scale. Equipment similar to that used to perform routine inspections of oil tanks and large pipelines was used. UT sensors were mounted on a remote-controlled crawler that used magnetic wheels to affix itself and move about on the tank walls. The crawler was deployed into the tank annulus and vertically traversed the primary and secondary containment walls to collect data on the wall thickness and the size of any pits or cracks. The successful completion of this inspection met the requirements of RL Milestone T21-97-455 and represented the first UT inspection of a Hanford DST (Final Report - Ultrasonic Examination of Tank 241-AW-103 Walls, Leshikar 1997).

In fiscal year (FY) 1998, FY 1999, and FY 2000, similar inspections were performed per Engineering Task Plans HNF-2820 (Engineering Task Plan for the Ultrasonic Inspection of Hanford Double-Shell Tanks, Pfluger 1999) and RPP-5583 (Engineering Task Plan for the Ultrasonic Inspection of Hanford Double-Shell Tanks - FY2000, Jensen 2000) on 241-AN-107, 241-AN-106, 241-AN-105, 241-AY-102, 241-AZ-101, 241-AP-107, and 241-AP-108. An

attempt was made to examine 241-AY-101 in FY 1999, but corrosion product on the tank wall prevented reliable examination.

In June 2000, WDOE issued an Administrative Order requiring UT examinations of the remaining 20 DSTs through FY 2005 (Administrative Order No. 00NWPKW-1251, Failure to Comply with Major Milestone M-32 of the Tri-Party Agreement, Silver 2000). In 2003, the WDOE Administrative Order (Silver 2000) was incorporated into the Hanford Federal Facility Agreement and Consent Order Milestone Series M-48 (HFFACO 2003), requiring examination during each FY through FY 2005 of four DSTs not previously examined. Based on the results of the above listed eight DST inspections and per the Milestone Series M-48 (HFFACO 2003), engineering task plans were prepared for ultrasonic DST inspections scheduled for the subsequent fiscal years.

In FY 2001, UT inspections were performed on four DSTs: 241-AN-102, 241-AW-101, 241-AW-105, and 241-AY-101 (following cleaning of selected areas of the 241-AY-101 wall). These DSTs were examined per Engineering Task Plan RPP-6839 (Engineering Task Plan for the Ultrasonic Inspection of Hanford Double-Shell Tanks - FY2001, Jensen 2000a).

In FY 2002, UT inspections were performed on four more DSTs: 241-AN-101, 241-AW-102, 241-AW-104, and 241-AW-106. Also in FY 2002, a more extensive examination of 241-AY-101 was performed, and an examination of 241-AP-108 was limited to characterization of the linear indication found in FY 2000. In addition, a limited scope reexamination of the upper walls of tank 241-AN-105 was performed in FY 2002. These DSTs were examined per RPP-7869 (Engineering Task Plan for the Ultrasonic Inspection of Hanford Double-Shell Tanks - FY2002, Jensen 2002), and RPP-8867 (Engineering Task Plan for the Ultrasonic Inspection of Hanford Double-Shell Tanks 241-AP-108, 241-AY-101, and 241-AZ-102 - FY2002, Jensen 2002a).

In FY 2003, UT inspections were performed on four more DSTs: 241-AP-101, 241-AP-103, 241-AP-105, and 241-AZ-102. Also, a primary tank lower knuckle inspection on 241-AW-102 using the Tandem Synthetic Aperture Focusing Technique (T-SAFT) not completed during FY 2002 was completed in early FY 2003. In addition, a supplementary, limited scope examination of the tank 241-AY-101 secondary tank wall was completed. These DSTs were examined per RPP-11832 (Engineering Task Plan for the Ultrasonic Inspection of Hanford Double-Shell Tanks - FY2003, Jensen 2002b).

In FY 2004, UT inspections were performed on four more DSTs: 241-SY-101, 241-SY-102, 241-SY-103, and 241-AP-104. A limited scope examination of tank 241-AN-105 originally planned for FY 2004 was deferred until FY 2005. These DSTs were examined per RPP-17750 (Engineering Task Plan for the Ultrasonic Inspection of Hanford Double-Shell Tanks - FY2004, Jensen 2003).

In FY 2005, UT inspections were planned on four more DSTs: 241-AN-103, 241-AN-104, 241-AP-102, and 241-AP-106. Limited scope examinations of tanks 241-AN-101, 241-AN-105, 241-AP-104 and 241-SY-101 were also planned for FY 2005. These DSTs were to be examined per RPP-22571 (Engineering Task Plan for the Ultrasonic Inspection of Hanford Double-Shell Tanks - FY2005, Jensen 2005).

DST 241-AN-104 was the fourth of the four tanks selected for standard inspection in FY 2005 (tanks 241-AN-103, 241-AP-102, and 241-AP-106 examinations have been completed). Inspection of tank 241-AN-104 was completed in the fourth quarter of FY 2005, and is the subject of this report. The services of COGEMA Engineering Corporation (COGEMA Engineering) were retained to provide UT examinations, procedures and inspectors, and to report the inspection results. Examination of 241-AN-104 was performed with UT equipment provided by CH2M HILL Hanford Group, Inc. (CH2M HILL).

2.0 OBJECTIVE AND SCOPE

This report describes the inspection system, evaluates the inspection results, and documents findings with conclusions and recommendations. The inspections described in this report include the primary tank wall, the liquid/air interface, the vertical weld Heat Affected Zones (HAZ), the primary knuckle, and the horizontal cylinder/knuckle weld HAZ.

The inspections were conducted in accordance with the criteria and scope set forth in RPP-RPT-22571 (Jensen 2005) for the FY 2005 UT inspection of DST 241-AN-104.

3.0 INSPECTION EQUIPMENT DESCRIPTION

Crawler / Scanning Bridge Systems — The crawler is a remotely controlled device that delivers the ultrasonic transducers to the tank walls. The crawler used during most P-scan imaging weighs approximately 35 pounds and has dimensions (including its traveling bridge) of approximately 21 inches wide by 18 inches long by 6 inches high. The traveling bridge on the crawler can be outfitted with various ultrasonic transducer configurations (Figure 3-1).

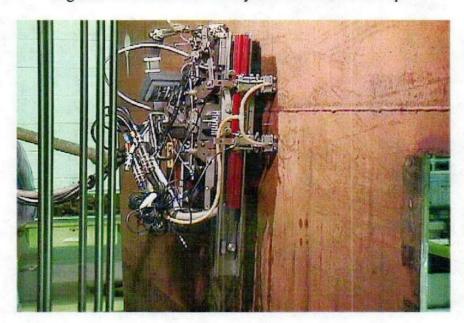


Figure 3-1. P-scan Crawler System on Tank Mock-up

The crawler is deployed through a 24 inch annulus inspection riser using customized deployment tools. The P-scan tank wall crawler attaches to the tank wall with two pairs of magnetic wheels. As the crawler moves slowly forward the transducers glide from side-to-side over the tank wall surface. Water couplant is continuously fed to all transducers at a rate needed to maintain an acceptable signal.

Deployment Tools – A deployment tool was specifically designed to insert and retrieve each scanning system into and out of the DST annular space. The scanner sits on a platform that is manually lowered to the appropriate elevation. The platform has cables attached that can be controlled to move the scanner platform into contact with the examination surface or to the secondary tank floor. The scanner is then driven onto the surface or the tank floor. The deployment tool is retracted until the scanner needs to be removed from the annular space.

P-scan – P-scan is the name of the computerized pulse-echo ultrasonic inspection system used by the inspection vendor. The P-scan system is manufactured by Force Institute in Denmark. It acquires data from zero and angle beam transducers mounted on the crawler, allows real-time analysis, and records the data in electronic memory for post inspection analysis. Force Institute has designated "P-scan mode" to represent the angle beam (flaw length) view and "T-scan

mode" to represent the zero beam (thickness) view. T-scan mode is used for normal operation and, if crack-like indications are detected, then the P-scan mode is employed.

During normal T-scan and P-scan operations, the waveforms of the reflected sound wave signals for each transducer are displayed in the "A-scan monitoring mode". The displays are continuously monitored (but not saved), and are primarily used to verify that the transducers are functioning properly (e.g., there is proper probe contact, adequate water flowing, and correctly operating transducer cables). When an indication is detected, the area is rescanned using the "A-scan recording mode". The recorded A-scan waveforms are then reviewed off-line, serving as an additional tool in the evaluation of the indication.

Overview Camera – This camera was deployed to observe the area immediately around the inspection area and to aid crawler deployment in the annulus.

Side-view Camera – This camera and light system were installed in a riser adjacent to the inspection riser to provide an overall view of the inspection process.

Data Acquisition Control Center – A tent-like structure was used to house the crawler controls, video monitors, and data collection and evaluation hardware. The tent was located outside the AN Tank Farm boundary fence.

4.0 UT INSPECTION DESCRIPTION

The following is the description of the data collection methodology:

Tank inspection was performed under Computerized History and Maintenance Planning System (CHAMPS) work package number 2E-04-02395. All work steps, guidelines, procedures, personnel responsibilities, and protocol for the inspection (Jensen 2005) were included in the subject work package. The COGEMA Engineering procedure that establishes the methods, equipment and requirements for the UT measurements and flaw detection is *Automated Ultrasonic Examination For Corrosion And Cracking*, COGEMA-SVUT-INS-007.3 (Attachment 1).

<u>P-scan Crawler for Tank Walls and Knuckle</u> - A remotely controlled, steerable crawler was used to deliver the P-scan UT transducers to the tank wall (Figure 3-1). The crawler was deployed through the 24 inch diameter annulus inspection Riser Number 026 to perform the vertical wall scans, the horizontal wall scans, the knuckle wall scans, and the vertical and horizontal weld scans.

The P-scan crawler inspects the primary tank wall using one dual-element 0° transducer to detect wall thinning and corrosion pitting, and two 45° shear-wave transducers to detect cracking transverse to the scanning direction. This examination setup is illustrated in the Figure 4-1 schematic.

Top View (Transducers Only) Side View Crawler Crawler Scan Scan Travel Travel Direction Direction © Direction Direction X **Bridge Fixture** Transducers Tank 45° Wall 0° 45° Angle-beam 0° Straight-beam Transducers Transducer Tank Wall

Figure 4-1. Schematic of UT Setup for Vertical Wall Inspection

Vertical Wall Inspection Setup – Uses two 45° Transducers and one 0° Transducer (Inspect for Wall Thinning, Pitting and Axial Cracks)

Note that the examination of the welds and HAZ actually consist of angle beam examinations in the HAZ. The welds are not directly examined since the physical configuration does not permit

transducer placement on the weld. This physical configuration is the weld crown. The DSTs were not designed or fabricated for in-service inspection, and therefore the weld crowns were not prepared for examination.

To detect cracks parallel to the weld, a 60° shear-wave transducer was directed toward the weld and a dual-element 0° transducer is also included to detect wall thinning and corrosion pitting (Figure 4-2). The examination of the HAZ using 60° angle beams will provide some coverage of the actual weld to the inside surface. For example, in a previous UT examination, a "lack of fusion" in a weld was identified (*Ultrasonic Inspection Results for Double-Shell Tank* 241-AP-103, Jensen 2003a).

Top View (Transducers Only) Side View Crawler Crawler Scan Travel Travel Direction Direction, Direction Direction **Bridge Fixture** Weld Transducers Transducers Weld Tank 60° 60° 00 0° Straight-beam 60° Angle-beam Transducer Transducer Cracks

Figure 4-2. Schematic of UT Setup for First Pass of Weld Inspections

First Pass of Vertical and Horizontal Weld Inspection – Uses two 60° Transducers and two 0° Transducers (Inspect for Wall Thinning, Pitting and HAZ Cracks Parallel to the Weld)

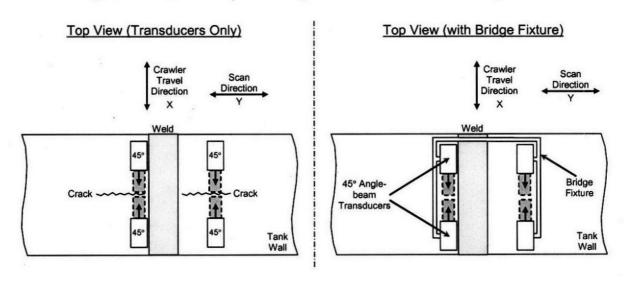
To detect cracks oriented perpendicular to welds, two opposing 45° shear-wave transducers were directed parallel to the weld. Welds were examined from both sides of the weld crown (Figure 4-3). Note that weld and weld examination refer to the UT examination of the HAZ.

A special extension arm was attached to the crawler to inspect the primary tank knuckle region. Two 45° shear-wave transducers were attached to the end of the arm to detect cracking transverse to the scanning direction (Figure 4-4). To detect wall thinning and corrosion pitting in the knuckle region, one dual-element 0° transducer was attached to the arm (Figure 4-5).

The setup in Figure 4-5 is used to examine extended, continuous lengths of the primary lower knuckle (typically 20 feet), but interference between the transducer and the insulating concrete pad below the knuckle restricts the examination region to the upper 11 to 12 inches of the knuckle. To inspect lower portions of the knuckle (within a few inches of the tank bottom plate weld), the P-scan transducer can be lined up with air slots in the insulating concrete, permitting approximately 1 inch wide scans in the selected slots (Figure 4-6).

Data and images from the P-scan system were returned to a nearby control center located outside the tank farm fence. The control center contained the crawler controls, video monitors, and data collection and evaluation software and hardware. The UT inspector continuously monitored the signals for reportable indications. The entire inspection was viewed by a camera and lighting system deployed through an adjacent riser.

Figure 4-3. Schematic of UT Setup for Second Pass of Weld Inspections



Second Pass of Vertical and Horizontal Weld Inspection – Uses four 45° Transducers (Inspect for HAZ Cracks Perpendicular to the Weld)

Figure 4-4. Schematic of UT Setup for Inspection of Cracks at Knuckle

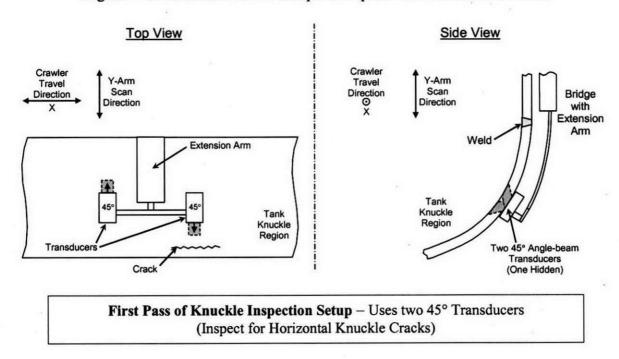
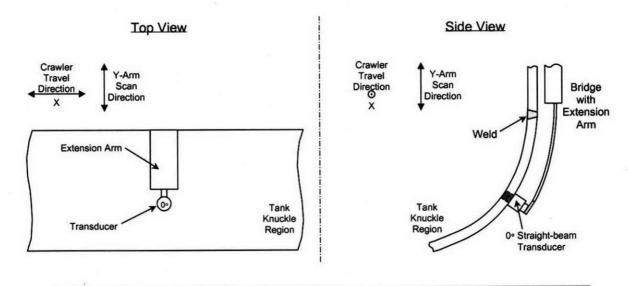
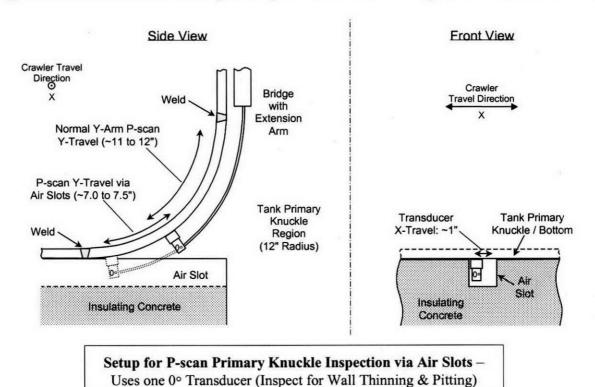


Figure 4-5. Schematic of UT Setup for Inspection of Wall Thinning at Knuckle



Second Pass of Knuckle Inspection Setup – Uses one 0° Transducer (Inspect for Wall Thinning)

Figure 4-6. Schematic of UT Setup for Inspection of Wall Thinning at Knuckle via Air Slots



5.0 INDICATION REPORTING CRITERIA

COGEMA Engineering was required to report to the customer the following anomalies:

- Wall thinning that exceeded 10 percent of the nominal wall thickness
- Pit depths that exceeded 25 percent of the nominal wall thickness
- Cracks that exceeded 0.1 inch in depth

The reporting criteria is established to identify indications that should be tracked. This tracking is to be used to determine if there is any active mechanism causing additional thinning, pit growth, or crack growth, based on subsequent examinations on the eight to ten year examination interval. The values are nominally 50% of the "acceptance criteria" established in *Acceptance Criteria for Non-Destructive Examination of Double-Shell Tanks* (Jensen 1995) and recommended in *Guidelines for Development of Structural Integrity Programs for DOE High-Level Waste Storage Tanks* (Bandyopadhyay et al. 1997).

For indications exceeding the "acceptance criteria", actions are initiated to evaluate the operability of the DST (Jensen 2005) through the occurrence reporting process. Indications exceeding the "reporting criteria" are reported to the CH2M HILL Project Engineer to be documented in the inspection report (Jensen 2005).

6.0 PERFORMANCE DEMONSTRATION TESTS

Prior to field use, COGEMA Engineering personnel satisfactorily completed a Performance Demonstration Test (PDT). The test was conducted to qualify personnel, test procedures, and ensure the equipment's ability to detect and size wall thinning, pits, and cracks in a series of test plates with artificial defects. The performance demonstration test was performed on a tank mock-up in the 306E Facility located in the Hanford Site 300 Area. This mock-up also demonstrated the successful deployment and retrieval of the equipment.

The Pacific Northwest National Laboratory (PNNL) report, "Report on Performance Demonstration Test – PDT, May 2000" (Attachment 3 of Ultrasonic Inspection Results of Double-Shell Tank 241-AP-108, Jensen 2000b) provides the details of the complete evaluation of the P-scan system PDT.

7.0 TANK 241-AN-104 HISTORY

The 241-AN Tank Farm consists of seven DSTs located in the 200 East Area of the Hanford Site. These underground tanks were built in 1980 and 1981, and are 75 feet in diameter with an operating capacity of 1.16 million gallons.

Tank 241-AN-104 entered service in 1982, receiving raw water. The tank received double-shell slurry feed waste from tank 241-AW-102 in the fourth quarter of 1982, and the first quarter of 1984. In the fourth quarter of 1983, the tank received PUREX waste. In the first quarter of 1984, waste was transfered to tanks 241-AZ-102 and 241-AN-105. In the third quarter of 1984, 82 kgal of flush water was added to the tank, and waste was transfered to tank 241-AN-103. From the fourth quarter of 1984 to the second quarter of 1985, the tank received double-shell slurry feed waste from tank 241-AW-102 via the evaporator. The last transfer was a small amount of flush water added in 1996 (Hu 1997).

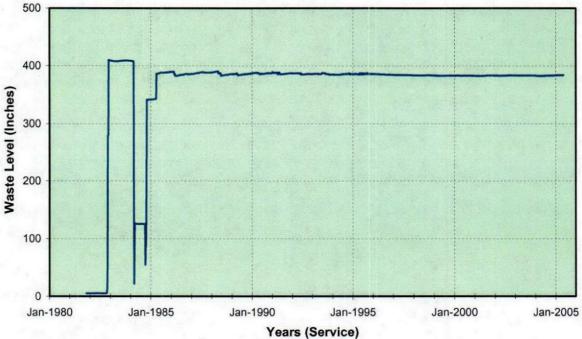
Tank 241-AN-104 currently contains approximately 1,053,000 gallons of waste equivalent to approximately 384 inches: 608,000 gallons of supernatant (~220 inches), and 445,000 gallons of sludge (~164 inches) The tank is categorized as sound. (Waste Tank Summary Report for Month Ending May 31, 2005, Naiknimbalkar 2005).

The waste level history since October 1981 is shown in Figure 7-1, based on data obtained from the Tank Waste Information Network System (TWINS)¹.

¹ TWINS, http://twins.pnl.gov/twins.htm, queried 5/27/05 [Data Source: Measurements, SACS, Surface Level, Tank Name AN-104, All Measurement Date values]

Figure 7-1. Waste Level History of Double-Shell Tank 241-AN-104

241-AN-104 Tank Waste Levels



Since 1983, the minimum recorded waste level was approximately 21 inches (March 1984), and the maximum recorded waste level was approximately 409 inches (January 1983). During the nineteen year period between January 1986 and May 2005, the waste level remained relatively constant, averaging 384 inches. Since 1995, the average waste level has been 383 inches.

Since 1990, recorded temperatures of the tank have ranged from a maximum of 125°F (August 1993) to a minimum of 62°F (January 2004), and have averaged 94°F. Since 2002, Tank temperatures have averaged 91°F. This is based on data obtained from the TWINS².

² TWINS, http://twins.pnl.gov/twins.htm, queried 5/25/05 [Data Source: Measurements, SACS, Tank Temperature Readings, Tank Name AN-104, All Measurement Date values].

8.0 GENERAL REQUIREMENTS AND INSPECTION SCOPE

FY 2005 Contract Number 21186, Release 14, specifies that the contractor provide (among others) the following deliverables to the Double-Shell Tank Integrity Project (DSTIP) organization:

- The contractor shall provide AN-104 NDE Support and Data Analysis
- The contractor shall prepare recommended engineering reports and studies as directed by the DSTIP project leads

The areas on the primary tank that were identified for UT inspection in the engineering task plan (Jensen 2005) and work package number 2E-04-02395 are described below.

Primary Tank Wall and Welds:

- A vertical strip (approximately 30 to 34 inches wide by 35 feet long) of the primary tank wall between the upper haunch transition and the lower knuckle for pits, cracks, and wall thinning. The vertical strip may be comprised of one or more strips whose total width is 30 inches.
- A horizontal strip (17 inches wide by 20 feet long) centered on the average elevation of the liquid-air interface that existed for five years or longer.
- Twenty feet of the circumferential weld joining the cylinder to the lower knuckle, one vertical weld joining the lowest shell course plates (about 10 feet of weld), and one vertical weld joining the next to the lowest shell course plates (about 10 feet of weld). A minimum of twenty (20) feet of vertical weld shall be examined.

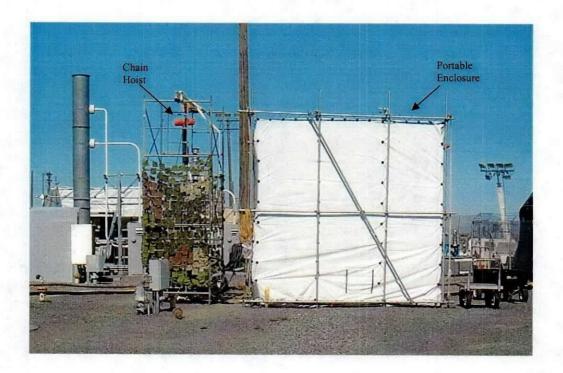
Primary Tank Knuckle:

• A strip in the lower knuckle to detect the presence of cracks oriented in the circumferential direction, and for pits and wall thinning. The area to be examined is 20 feet long in the circumferential direction, and in the meridional direction, is from the weld joining the transition plate with the knuckle to the farthest reach of the transducer assembly that is allowed by the tank geometric constraints (using the flexible arm attachment to the existing P-scan system) – supplemented by T-SAFT, if available). The 20 foot dimension is not required to be a continuous length. Examination segments that add up to 20 feet in length are acceptable.

9.0 EQUIPMENT SETUP AT AN TANK FARM

Prior to performing the actual inspection, the shield plug was removed from the 24 inch Riser 026, and a temporary cover and riser extension were secured to the riser. A portable enclosure was installed near the riser to provide the means for deploying the UT equipment and protecting the operators from the weather. An electric chain hoist, mounted to scaffolding adjacent to the portable enclosure was used for maneuvering the equipment into position. The control center enclosure was set up outside the AN Tank Farm's boundary fence, and the control cables were run along the ground to the equipment located at the riser. The tank farm setup is shown in Figure 9-1.

Figure 9-1. UT Equipment Arrangement at DST AN-104 7/14/05



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10.0 INSPECTION RESULTS

Tank 241-AN-104 was fabricated from carbon steel plate. The primary tank's exterior surface varies from mill scale to coatings of various degrees of rust caused by in-service corrosion of carbon steel. A description of the plates is as follows with the location of the plates as shown in Figure 10-1 (*Tank Cross Section 241-AN Tanks*, Vitro Hanford 1979).

Primary Tank Upper Knuckle – Connects dome of tank to side-wall

Primary Tank Wall – Consists of (from top to bottom)

Plate #1 – approximately 7 feet 8 inch tall, 1/2 inch nominal thickness

Plate #2 – approximately 7 feet 8 inch tall, 1/2 inch nominal thickness

Plate #3 – approximately 7 feet 8 inch tall, 1/2 inch nominal thickness

Plate #4 – approximately 9 feet tall, 3/4 inch nominal thickness

Plate #5 – approximately 2 feet tall, 7/8 inch nominal thickness

Primary Tank Lower Knuckle – Approximately 7/8 inch nominal thickness. Connects sidewall of tank to primary tank bottom.

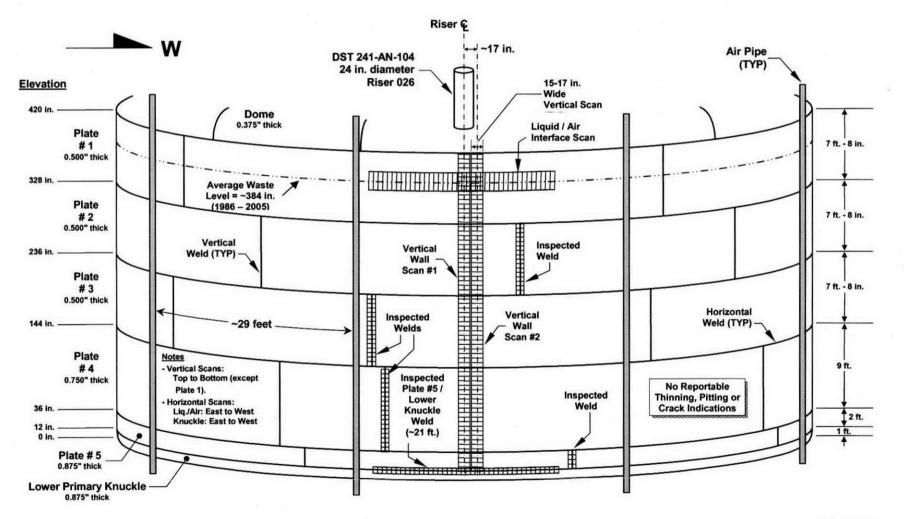
Primary Tank Bottom – Connected to primary tank lower knuckle. The outer three feet is approximately 7/8 inch nominal thickness, transitioning to 1/2 inch nominal thickness.

The P-scan crawler was deployed through the 24 inch diameter annulus inspection Riser 026 at the north side of tank 241-AN-104 for examinations of the primary tank wall, primary knuckle, and vertical and horizontal welds. All tank welds examined were in the "as-welded" condition. The various scan paths for the crawlers are shown in Figure 10-1, along with other pertinent tank information.

Additional P-scan measurements of the primary knuckle were made using the P-scan crawler equipped with a flexible extension arm that was extended into selected air slots in the insulating concrete (Figure 10-2).

The UT P-scan data were examined by COGEMA Engineering's Level III certified inspector and by Limited Level II certified inspectors. The Limited Level II inspectors were "P-scan Limited", indicating that they are qualified to collect and examine the P-scan data, but are not qualified to interpret the data.

Figure 10-1. Schematic of UT Scan Paths on North Side of Tank 241-AN-104 Wall (via Riser 026)



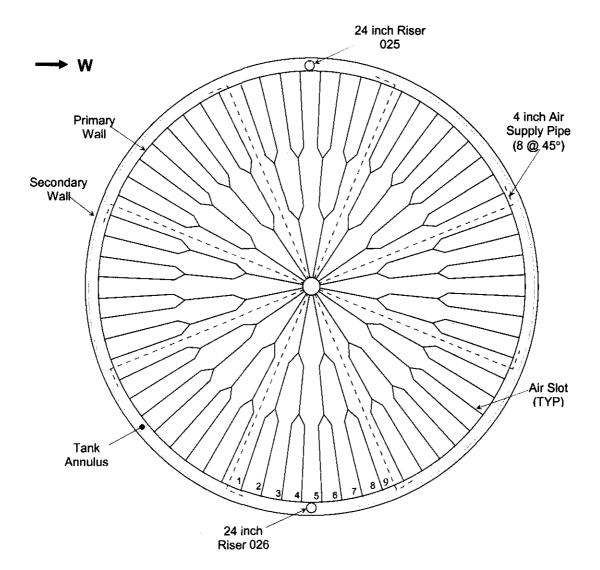


Figure 10-2. Air Slots Under Tank Bottom of DST 241-AN-104

Inspection Method	Air Slot Number	Data Sheet File Name
	2	Slot 2
P-scan Inspection of	7	Slot 7
Primary Tank Lower Knuckle via Air Slots	8	Slot 8
	9	Slot 9

The following pages contain tables that present summary and detailed wall thickness data, which were derived from the COGEMA "Automated Ultrasonic Thickness Data Report Sheets". The inspection data sheets, the transducer calibration sheets, the original tank wall and weld scan map, and an interpretation of the data by an independent Level III certified NDE Inspector are included in Attachment 2 for the P-scan data.

Tables 10-1 through 10-3 summarize the minimum wall thickness values obtained using the P-scan system on the primary tank walls, which includes the liquid-air interface of Plate #1.

Tables 10-4 and 10-5 summarize the minimum wall thickness values obtained using the P-scan system on the primary tank vertical welds and the primary tank lower knuckle weld.

Although the data are reported to three significant figures, the accuracy of the wall thickness data, based on the results of the performance demonstration test, is 0.012 inch root-mean-square (RMS).

Table 10-1. Summary of Primary Tank Wall Scan 1 (via Riser 026)

Plate Description	Elevation of Wall Scan (inches)	Wall Scan Distance (inches) (1)	Design Nominal (inches)	Measured Minimum (inches)	Scan Minimum % of Nominal
Plate #1	421.2 to 329	92.2	0.500	0.493	98.6%
Plate #2	327 to 237.1	89.9	0.500	0.499	99.8%
Plate #3	235 to 145.3	89.7	0.500	0.489	97.8%
Plate #4	143 to 37.1	105.9	0.750	0.744	99.2%
Plate #5	35 to 14.11	20.89	0.875	0.859	98.2%

⁽¹⁾ Scan widths were 15-17 inches.

Table 10-2. Summary of Primary Tank Wall Scan 2 (via Riser 026)

Plate Description	Elevation of Wall Scan (inches)	Wall Scan Distance (inches) (1)	Design Nominal (inches)	Measured Minimum (inches)	Scan Minimum % of Nominal
Plate #1	419.3 to 329	90.3	0.500	0.480	96.0%
Plate #2	327 to 237.6	89.4	0.500	0.499	99.8%
Plate #3	235 to 145.4	89.6	0.500	0.490	98.0%
Plate #4	143 to 37.1	105.9	0.750	0.743	99.1%
Plate #5	35 to 13.8	21.2	0.875	0.857	97.9%

⁽¹⁾ Scan widths were 15-17 inches.

Table 10-3. Summary of Primary Tank Liquid-Air Interface Wall Scan (via Riser 026)

Plate Description	Elevation of Horizontal Wall Scan (inches)	Wall Scan Distance (inches) ⁽¹⁾	Design Nominal (inches)	Measured Minimum (inches)	Scan Minimum % of Nominal
Liquid-Air Interface Plate #1	381.5 to 398.5	249.2	0.500	0.498	99.6%

⁽¹⁾ Scan width was 17 inches.

Table 10-4. Summary of Primary Tank Vertical Weld Scans (via Riser 026)

Weld Description	Elevation of Weld Scan (inches)	Weld Scan Distance (inches) ⁽¹⁾	Design Nominal (inches)	Measured Minimum (inches)	Scan Minimum % of Nominal
Vertical Weld Plate #2	327 to 238.6	88.4	0.500	0.478	95.6%
Vertical Weld Plate #3	235 to 145.5	89.5	0.500	0.463	92.6%
Vertical Weld Plate #4	143 to 40.2	102.8	0.750	0.708	94.4%
Vertical Weld Plate #5	35 to 13.7	21.3	0.875	0.859	98.2%

Scan widths were 11.1 - 11.58 inches.

Table 10-5. Summary of Plate #5 / Knuckle Horizontal Weld Scans (via Riser 026)

Weld Description	Vertical Location of Weld Scan	Weld Scan Distance (inches) ⁽¹⁾	Design Nominal (inches)	Measured Minimum (inches)	Scan Minimum % of Nominal
Horizontal Weld Plate #5 to Knuckle, Plate #5 Side	From ~1 in. to ~5 in. above Plate #5 / Knuckle Weld	254	0.875	0.852	97.4%
Horizontal Weld Plate #5 to Knuckle, Knuckle Side	From ~1 in. to ~5 in. below Plate #5 / Knuckle Weld	249.2	0.875	0.880	100.6%

⁽¹⁾ Scan widths were 9.5 to 10.5 inches

Tables 10-6 through 10-15 contain the detailed data for the primary tank vertical wall scans as presented in 12 inch long by 15 to 17 inch wide connecting scans. Table 10-16 contains the detailed data for the Plate #1 liquid-air interface scan as presented in 12 inch long by 17 inch wide connecting scans.

Table 10-6. Primary Tank Vertical Wall Scan 1 – Plate #1 (via Riser 026)

Scan I.D. Number (Data Sheets)	Elevation of Start of Wall Scan (inches)	Vertical Location of Wall Scan (inches)	Design Nominal (inches)	Measured Average (inches)	Measured Minimum (inches)
	329	0 – 12 (1)	0.500	0.525	0.504
	341	12 – 24	0.500	0.530	0.498
O 697 - 1 197 19 /	353	24 – 36	0.500	0.530	0.493
Scan "Vert. Wall / Plate 1"	365	36 – 48	0.500	0.530	0.508
(Page Att. 2-3)	377	48 – 60	0.500	0.530	0.509
(= =80 == = 0)	389	60 – 72	0.500	0.530	0.502
	401	72 – 84	0.500	0.530	0.499
	413	84 – 92.2	0.500	0.525	0.508

⁽i) Scan start was 1 inch above the centerline of the second horizontal weld (scanned from bottom of plate to top of plate), and centerline of 24 inch Riser 026; Scan width was 15 inches.

Table 10-7. Primary Tank Vertical Wall Scan 1 - Plate #2 (via Riser 026)

Scan I.D. Number (Data Sheets)	Elevation of Start of Wall Scan (inches)	Vertical Location of Wall Scan (inches)	Design Nominal (inches)	Measured Average (inches)	Measured Minimum (inches)
	327	0 – 12 ⁽¹⁾	0.500	0.525	0.499
	315	12 – 24	0.500	0.525	0.499
Scan	303	24 – 36	0.500	0.525	0.504
"Vert. Wall / 0 /	291	36 – 48	0.500	0.525	0.503
Plate 2"	279	48 – 60	0.500	0.525	0.499
(Page Att. 2-4)	267	60 – 72	0.500	0.525	0.503
	255	72 – 84	0.500	0.525	0.499
	243	84 – 89.9	0.500	0.525	0.499

⁽¹⁾ Scan start was 1 inch below the centerline of the second horizontal weld, and centerline of 24 inch Riser 026; Scan width was 17 inches.

Table 10-8. Primary Tank Vertical Wall Scan 1 - Plate #3 (via Riser 026)

Scan I.D. Number (Data Sheets)	Elevation of Start of Wall Scan (inches)	Vertical Location of Wall Scan (inches)	Design Nominal (inches)	Measured Average (inches)	Measured Minimum (inches)
	235	0 – 12 (1)	0.500	0.515	0.489
	223	12 – 24	0.500	0.520	0.493
Scan	211	24 – 36	0.500	0.525	0.498
"Vert. Wall / 0 /	199	36 – 48	0.500	0.525	0.503
Plate 3"	187	48 – 60	0.500	0.525	0.503
(Page Att. 2-5)	175	60 – 72	0.500	0.530	0.509
	163	72 – 84	0.500	0.530	0.497
	151	84 – 89.7	0.500	0.525	0.502

⁽¹⁾ Scan start was 1 inch below the centerline of the third horizontal weld, and centerline of 24 inch Riser 026; Scan width was 17 inches.

Table 10-9. Primary Tank Vertical Wall Scan 1 – Plate #4 (via Riser 026)

Scan I.D. Number (Data Sheets)	Elevation of Start of Wall Scan (inches)	Vertical Location of Wall Scan (inches)	Design Nominal (inches)	Measured Average (inches)	Measured Minimum (inches)
	143	0 – 12 (1)	0.750	0.770	0.744
	131	12 – 24	0.750	0.770	0.744
	119	24 – 36	0.750	0.770	0.744
Scan "Vert. Wall / 0 /	107	36 – 48	0.750	0.770	0.750
Plate 4"	95	48 – 60	0.750	0.770	0.753
(Page Att. 2-6)	83	60 – 72	0.750	0.770	0.754
	71	72 – 84	0.750	0.770	0.750
	59	84 – 96	0.750	0.770	0.747
	47	96 – 105.9	0.750	0.770	0.747

⁽¹⁾ Scan start was 1 inch below the centerline of the fourth horizontal weld, and centerline of 24 inch Riser 026; Scan width was 17 inches.

Table 10-10. Primary Tank Vertical Wall Scan 1 – Plate #5 (via Riser 026)

Scan I.D. Number (Data Sheets)	Elevation of Start of Wall Scan (inches)	Vertical Location of Wall Scan (inches)	Design Nominal (inches)	Measured Average (inches)	Measured Minimum (inches)
Scan "Vert. Wall / 0 / Plate 5"	35	0 – 12 (1)	0.875	0.890	0.864
(Page Att. 2-7)	23	12 – 20.89	0.875	0.890	0.859

⁽¹⁾ Scan start was 1 inch below the centerline of the fifth horizontal weld, and centerline of 24 inch Riser 026; Scan width was 15 inches.

Table 10-11. Primary Tank Vertical Wall Scan 2 - Plate #1 (via Riser 026)

Scan I.D. Number (Data Sheets)	Elevation of Start of Wall Scan (inches)	Vertical Location of Wall Scan (inches)	Design Nominal (inches)	Measured Average (inches)	Measured Minimum (inches)
	329	0 – 12 ⁽¹⁾	0.500	0.530	0.504
	341	12 – 24	0.500	0.530	0.480
	353	24 – 36	0.500	0.530	0.490
Scan "Vert. Wall / 2 nd / Plate 1"	365	36 – 48	0.500	0.530	0.494
(Page Att. 2-13)	377	48 – 60	0.500	0.530	0.502
(ruge rui. 2 15)	389	60 – 72	0.500	0.530	0.504
	401	72 – 84	0.500	0.525	0.499
	413	84 –90.3	0.500	0.525	0.498

⁽¹⁾ Scan start was 1 inch above the centerline of the second horizontal weld (scanned from bottom of plate to top of plate), and 17 inches west of Scan 1, centerline to centerline; Scan width was 17 inches.

Table 10-12. Primary Tank Vertical Wall Scan 2 – Plate #2 (via Riser 026)

Scan I.D. Number (Data Sheets)	Elevation of Start of Wall Scan (inches)	Vertical Location of Wall Scan (inches)	Design Nominal (inches)	Measured Average (inches)	Measured Minimum (inches)
	327	0 – 12 (1)	0.500	0.525	0.499
	315	12 – 24	0.500	0.525	0.502
G 497 - 117 11 /	303	24 – 36	0.500	0.525	0.501
Scan "Vert. Wall / 2 nd / Plate 2"	291	36 – 48	0.500	0.525	0.503
(Page Att. 2-14)	279	48 – 60	0.500	0.530	0.503
(= ::0 = = :)	267	60 – 72	0.500	0.530	0.507
	255	72 – 84	0.500	0.525	0.501
	243	84 – 8947	0.500	0.525	0.503

⁽¹⁾ Scan start was 1 inch below the centerline of the second horizontal weld, and 17 inches west of Scan 1, centerline to centerline; Scan width was 15 inches.

Table 10-13. Primary Tank Vertical Wall Scan 2 - Plate #3 (via Riser 026)

Scan I.D. Number (Data Sheets)	Elevation of Start of Wall Scan (inches)	Vertical Location of Wall Scan (inches)	Design Nominal (inches)	Measured Average (inches)	Measured Minimum (inches)
	235	0 – 12 (1)	0.500	0.515	0.494
	223	12 – 24	0.500	0.520	0.496
	211	24 – 36	0.500	0.525	0.499
Scan "Vert. Wall / 2 nd / Plate 3"	199	36 – 48	0.500	0.525	0.490
(Page Att. 2-15)	187	48 – 60	0.500	0.525	0.500
	175	60 – 72	0.500	0.525	0.503
	163	72 – 84	0.500	0.525	0.501
	151	84 – 89.6	0.500	0.525	0.490

⁽¹⁾ Scan start was 1 inch below the centerline of the third horizontal weld, and 17 inches west of Scan 1, centerline to centerline; Scan width was 17 inches.

Table 10-14. Primary Tank Vertical Wall Scan 2 - Plate #4 (via Riser 026)

Scan I.D. Number (Data Sheets)	Elevation of Start of Wall Scan (inches)	Vertical Location of Wall Scan (inches)	Design Nominal (inches)	Measured Average (inches)	Measured Minimum (inches)
	143	0 – 12 (1)	0.750	0.765	0.744
	131	12 – 24	0.750	0.765	0.743
	119	24 – 36	0.750	0.770	0.746
Scan "Vert. Wall /	107	36 – 48	0.750	0.770	0.749
2 nd / Plate 4"	95	48 – 60	0.750	0.770	0.752
(Page Att. 2-16)	83	60 – 72	0.750	0.770	0.753
	71	72 – 84	0.750	0.775	0.744
	59	84 – 96	0.750	0.775	0.751
	47	96 – 105.9	0.750	0.775	0.754

⁽¹⁾ Scan start was 1 inch below the centerline of the fourth horizontal weld, and 17 inches west of Scan 1, centerline to centerline; Scan width was 17 inches.

Table 10-15. Primary Tank Vertical Wall Scan 2 - Plate #5 (via Riser 026)

Scan I.D. Number (Data Sheets)	Elevation of Start of Wall Scan (inches)	Vertical Location of Wall Scan (inches)	Design Nominal (inches)	Measured Average (inches)	Measured Minimum (inches)
Scan "Vert. Wall / 2 nd / Plate 5"	35	0 – 12 (1)	0.875	0.890	0.857
(Page Att. 2-17)	23	12 – 21.2	0.875	0.885	0.858

⁽¹⁾ Scan start was 1 inch below the centerline of the fifth horizontal weld, and 17 inches west of Scan 1, centerline to centerline; Scan width was 115 inches.

Table 10-16. Primary Tank Wall Historical Liquid-Air Interface Scan - Plate #1 (via Riser 026)

Scan I.D. Number (Data Sheets)	Elevation of Horizontal Wall Scan (inches)	Horizontal Location of Wall Scan (inches)	Design Nominal (inches)	Measured Average (inches)	Measured Minimum (inches)
	381.5	0 – 12 (1)	0.500	0.530	0.501
Liquid / Air A	761.5 To	12 – 24	0.500	0.530	0.503
(Page Att. 2-23)	398.5	24 – 36	0.500	0.530	0.498
	370.3	36 – 37.28	0.500	0.530	0.511
Liquid / Air B	381.5 to	0 – 12 (2)	0.500	0.530	0.501
(Page Att. 2-24)	398.5	12 – 21.7	0.500	0.530	0.505
		0 – 12 (3)	0.500	0.535	0.508
		12 – 24	0.500	0.535	0.510
		24 – 36	0.500	0.535	0.503
	381.5	36 – 48	0.500	0.535	0.511
Liquid / Air C	381.3 To	48 - 60	0.500	0.535	0.510
(Page Att. 2-25)	398.5	60 – 72	0.500	0.535	0.511
	376.3	72 – 84	0.500	0.535	0.513
		84 – 96	0.500	0.535	0.504
		96 – 108	0.500	0.535	0.514
		108 – 120	0.500	0.535	0.505
		0 – 12 (4)	0.500	0.535	0.503
		12 – 24	0.500	0.535	0.509
Liquid / Air D	381.5	24 – 36	0.500	0.535	0.506
(Page Att. 2-26)	To 398.5	36 – 48	0.500	0.535	0.504
	370.3	48 – 60	0.500	0.535	0.500
		60 - 72	0.500	0.535	0.504

⁽¹⁾ Start of scan @ east air line; Scan width was 17 inches.
(2) Start of scan @ end of Liquid / Air A; Scan width was 17 inches.

⁽³⁾ Start of scan @ end of Liquid / Air B; Scan width was 17 inches.

⁽⁴⁾ Start of scan @ end of Liquid / Air C; Scan width was 17 inches.

Table 10-17. Primary Tank Vertical Wall Weld Scan - Plate #2 (via Riser 026)

Scan I.D. Number (Data Sheets)	Elevation of Start of Weld Scan (inches)	Vertical Location of Weld Scan (inches)	Design Nominal (inches)	Measured Average (inches)	Measured Minimum (inches)
	327	0 – 12 (1)	0.500	0.520	0.478
	315	12 – 24	0.500	0.520	0.482
Scan	303	24 – 36	0.500	0.520	0.481
"Vert. Weld/	291	36 – 48	0.500	0.520 0.520	0.487
Plate 2"	279	48 – 60	0.500	0.520	0.488
(Page Att. 2-27)	267	60 – 72	0.500	0.520	0.482
	255	72 – 84	0.500	0.520	0.478
	243	84 – 88.4	0.500	0.520	0.482

⁽¹⁾ Scan start was 1 inch below the centerline of the second horizontal weld; Scan width was 11.3 inches.

Table 10-18. Primary Tank Vertical Wall Weld Scan - Plate #3 (via Riser 026)

Scan I.D. Number (Data Sheets)	Elevation of Start of Weld Scan (inches)	Vertical Location of Weld Scan (inches)	Design Nominal (inches)	Measured Average (inches)	Measured Minimum (inches)
	235	0 – 12 ⁽¹⁾	0.5625	0.520	0.485
	223	12 – 24	0.5625	0.520	0.482
Scan	211	24 – 36	0.5625	0.520	0.480
"Vert. Weld/	199	36 – 48	0.5625	0.520	0.487
Plate 3"	187	48 – 60	0.5625	0.520	0.487
(Page Att. 2-28)	175	60 – 72	0.5625	0.520	0.485
	163	72 – 84	0.5625	0.520	0.463
	151	84 – 88.6	0.5625	0.520	0.486

⁽¹⁾ Scan start was I inch below the centerline of the third horizontal weld; Scan width was 11.44 inches.

Table 10-19. Primary Tank Vertical Wall Weld Scan - Plate #4 (via Riser 026)

Scan I.D. Number (Data Sheets)	Elevation of Start of Weld Scan (inches)	Vertical Location of Weld Scan (inches)	Design Nominal (inches)	Measured Average (inches)	Measured Minimum (inches)
	143	0 – 12 (1)	0.750	0.760	0.708
	131	12 – 24	0.750	0.755	0.733
	119	24 – 36	0.750	0.755	0.731
Scan "Vert. Weld /	107	36 – 48	0.750	0.750	0.735
Plate 4"	95	48 – 60	0.750	0.755	0.731
(Page Att. 2-29)	83	60 – 72	0.750	0.755	0.729
,	71	72 – 84	0.750	0.755	0.730
	59	84 – 96	0.750	0.755	0.731
	47	96 – 102.8	0.750	0.760	0.738

⁽¹⁾ Scan start was 1 inch below the centerline of the fourth horizontal weld; Scan width was 11.58 inches.

Table 10-20. Primary Tank Vertical Wall Weld Scan - Plate #5 (via Riser 026)

Scan I.D. Number (Data Sheets)	Elevation of Start of Weld Scan (inches)	Vertical Location of Weld Scan (inches)	Design Nominal (inches)	Measured Average (inches)	Measured Minimum (inches)
Scan "Vert. Weld/	35	0 – 12 (1)	0.875	0.900	0.867
Plate 5" (Page Att. 2-30)	23	12 – 21.3	0.875	0.900	0.859

⁽¹⁾ Scan start was 1 inch below the centerline of the fifth horizontal weld; Scan width was 11.1 inches.

Table 10-21. Primary Tank Horizontal Weld - Plate #5 to Knuckle Scan, Plate #5 Side (via Riser 026)

Scan I.D. Number (Data Sheets)	Elevation of Horizontal Weld Scan (inches)	Horizontal Location of Weld Scan, Plate #5 Side (inches)	Design Nominal (inches)	Measured Average (inches)	Measured Minimum (inches)
		0 – 12 (1)	0.875	0.900	0.867
Scan	From ~1 in.	12 – 24	0.875	0.900	0.868
"Horiz. Weld/	To 5.25 in. Above	24 – 36	0.875	0.900	0.873
Knuckle"	Plate #5 /	36 – 48	0.875	0.900	0.874
(Page Att. 2-40)	Knuckle Weld	48 – 60	0.875	0.900	0.871
		60 – 64.8	0.875	0.900	0.871
- <u> </u>		0 – 12 (2)	0.875	0.900	0.868
		12 – 24	0.875	0.900	0.869
Scan	From ∼1 in.	24 – 36	0.875	0.895	0.859
"Horiz. Weld/	To 5.2 in.	36 – 48	0.875	0.890	0.863
Knuckle A"	Above	48 – 60	0.875	0.890	0.862
(Page Att. 2-41)	Plate #5 /	60 – 72	0.875	0.890	0.862
	Knuckle Weld	72 – 84	0.875	0.890	0.861
		84 – 96	0.875	0.890	0.861
		96 – 96.6	0.875	0.890	0.876
		0 - 12 (3)	0.875	0.890	0.861
		12 – 24	0.875	0.885	0.852
Scan	From ~1 in.	24 – 36	0.875	0.910	0.878
"Horiz. Weld/	To 4.75 in.	36 – 48	0.875	0.910	0.884
Knuckle B"	Above Plate #5 /	48 – 60	0.875	0.910	0.887
(Page Att. 2-42)	Knuckle Weld	60 - 72	0.875	0.910	0.876
	12monio oid	72 – 84	0.875	0.910	0.881
		84 – 92.63	0.875	0.910	0.877

⁽¹⁾ Start of scan west of weld attachment, west of east air line; scan width was 10.5 inches.
(2) Start of scan @ end of scan Horz. Weld / Knuckle; Scan width was 10.4 inches.

⁽³⁾ Start of scan @ west side of weld attachment, west of 24" riser; Scan width was 9.5 inches.

Table 10-22. Primary Tank Horizontal Weld - Plate #5 to Knuckle Scan, Knuckle Side (via Riser 026)

Scan I.D. Number (Data Sheets)	Elevation of Horizontal Weld Scan (inches)	Horizontal Location of Weld Scan, Knuckle Side (inches)	Design Nominal (inches)	Measured Average (inches)	Measured Minimum (inches)
	From ~1 in.	0 – 12 (1)	0.875	0.925	0.898
Scan "Horiz, Weld /	To 5.25 in.	12 – 24	0.875	0.925	0.901
Knuckle"	Below	24 – 36	0.875	0.925	0.903
(Page Att. 2-43)	Plate #5 /	36 – 48	0.875	0.925	0.889
(5	Knuckle Weld	48 – 60	0.875	0.925	0.920
		0 – 12 (2)	0.875	0.930	0.906
		12 – 24	0.875	0.930	0.902
_	From ~1 in.	24 – 36	0.875	0.930	0.895
Scan	To 5.2 in.	36 – 48	0.875	0.930	0.893
"Horiz. Weld / Knuckle A"	Below	48 – 60	0.875	0.930	0.890
(Page Att. 2-44)	Plate #5 /	60 – 72	0.875	0.925	0.882
(1 ugo 1111. 2-11)	Knuckle Weld	72 – 84	0.875	0.930	0.895
		84 – 96	0.875	0.925	0.880
		96 – 96.6	0.875	0.925	0.896
		0 - 12 (3)	0.875	0.925	0.892
		12 – 24	0.875	0.955	0.922
Scan	From ~1 in.	24 – 36	0.875	0.950	0.913
"Horiz. Weld /	To 4.75 in.	36 – 48	0.875	0.950	0.916
Knuckle B"	Below Plate #5 /	48 – 60	0.875	0.950	0.910
(Page Att. 2-45)	Knuckle Weld	60 – 72	0.875	0.940	0.907
		72 – 84	0.875	0.945	0.917
		84 – 92.63	0.875	0.925	0.913

⁽¹⁾ Start of scan west of weld attachment, west of east air line; scan width was 10.5 inches.

 ⁽²⁾ Start of scan @ end of scan Horz. Weld / Knuckle; Scan width was 10.4 inches.
 (3) Start of scan @ west side of weld attachment, west of 24" riser; Scan width was 9.5 inches.

Table 10-23. Primary Tank Lower Knuckle Scan Using The P-scan System (via Riser 026)

Scan I.D. Number (Data Sheets)	Vertical Location of Horizontal Knuckle Scan	Horizontal Location of Knuckle Scan (inches)	Design Nominal (inches)	Measured Average (inches)	Measured Minimum (inches)
		0 – 12 ⁽¹⁾	0.875	0.950	0.917
		12 – 24	0.875	0.945	0.902
		24 – 36	0.875	0.945	0.909
C	From 2 in. to	36 – 48	0.875	0.955	0.919
Scan "Y-Arm /	9.8 in, below	48 – 60	0.875	0.955	0.912
Knuckle"	Plate #5 /	60 – 72	0.875	0.955	0.920
(Page Att. 2-52)	Knuckle Weld	72 – 84	0.875	0.950	0.910
		84 – 96	0.875	0.940	0.903
		96 – 108	0.875	0.940	0.906
	!	108 – 120	0.875	0.940	0.900
Scan	From 2 in. to	0 – 12 (2)	0.875	0.940	0.910
"Y-Arm /	9.8 in. below	12 - 24	0.875	0.940	0.893
Knuckle A"	Plate #5 /	24 – 36	0.875	0.935	0.902
(Page Att. 2-53)	Knuckle Weld	36 – 47.1	0.875	0.935	0.885
Scan "Y-Arm /	From 2 in. to	0 – 12 ⁽³⁾	0.875	0.920	0.878
Knuckle B" (Page Att. 2-54)	10.4 in. below Plate #5 / Knuckle Weld	. 12 – 22.89	0.875	0.920	0.883
		0 – 12 (4)	0.875	0.960	0.929
Scan "Y-Arm/	From 2 in. to	12 - 24	0.875	0.955	0.920
	10.3 in. below Plate #5 /	24 - 36	0.875	0.965	0.923
Knuckle C" (Page Att. 2-55)	Knuckle Weld	36 - 48	0.875	0.965	0.920
(Fage Au. 2-33)		48 - 60.06	0.875	0.960	0.914

⁽¹⁾ Start of scan @ east air line; Scan width was 9.8 inches.

⁽²⁾ Start of scan @ end of scan knuckle; Scan width was 9.8 inches.

⁽³⁾ Start of scan @ end of weld attachment, west of 24 inch riser; Scan width was 10.4 inches.

⁽⁴⁾ Start of scan @ vert. weld, west of weld attachment, west of 24 inch riser; Scan width was 10.3 inches

Table 10-24. Primary Tank Lower Knuckle Scan Using the P-scan System in Air Slots (via Riser 026)

Scan I.D. Number (Data Sheets)	Vertical Location of Knuckle Scan in Slot	Vertical Y-Travel of Knuckle Scan in Slot (inches)	Design Nominal (inches)	Measured Average (inches)	Measured Minimum (inches)
Scan "Y-Arm / Slot 2" (Page Att. 2-58)	Exact starting positions not determined, but	6.65 ⁽¹⁾	0.875	0.960	0.947
Scan "Y-Arm / Slot 7" (Page Att. 2-59)	approximately 10 to 12 inches below the Plate #5 / Knuckle Weld; Scans overlap areas examined in continuous scans (see Table 10-23)	6.65 ⁽²⁾	0.875	0.975	0.955
Scan "Y-Arm / Slot 8" (Page Att. 2-60)		6.65 ⁽³⁾	0.875	0.975	0.960
Scan "Y-Arm / Slot 9" (Page Att. 2-61)		6.65 ⁽⁴⁾	0.875	0.970	0.954

⁽¹⁾ Horizontal x-travel of scan in slot was 0.725 inches.

⁽²⁾ Horizontal x-travel of scan in slot was 1.04 inches.
(3) Horizontal x-travel of scan in slot was 1.04 inches.
(4) Horizontal x-travel of scan in slot was 1.036 inches.

11.0 EVALUATION OF INSPECTION RESULTS

The results from the inspection of tank 241-AN-104 are evaluated and compared with results of all other tank ultrasonic inspections.

11.1 TANK 241-AN-104 UT DATA EVALUATION

The UT P-scan data were interpreted by W. H. Nelson, COGEMA Engineering's Level III certified inspector. The P-scan data were also examined by J. B. Elder, an independent Level III certified NDE Inspector. Mr. Elder independently evaluated the P-scan raw data and concurred with COGEMA Engineering's interpretation (Attachment 2). The P-scan data have also been evaluated by PNNL as a third party review. Their results and conclusions were found to be consistent with those described in this report. Their P-scan data review is *Ultrasonic Examination Of Double-Shell Tank 241-AN-104 - Examination Completed August 2005*, PNNL report number PNNL-15343, Rev. 0 (Attachment 3).

The results of the tank 241-AN-104 UT inspections indicated no reportable wall thinning, no pit-like indications, and no cracking in any of the areas examined. Figure 11-1 illustrates all of the "as-found" average wall thickness measurements of the primary tank vertical wall scans generated from the P-scan Inspection Data Sheets (Attachment 2). Each measurement plotted on Figure 11-1 is the average of all data collected over a 12 inch long by 17 inch wide scan area. Areas of interest for tank 241-AN-104 are the vapor space above the liquid waste, the historical liquid-vapor interface (approximately 384 inches), and the liquid region.

The overall average wall thickness measurements for the walls and weld HAZs are tabulated in Table 11-1. The UT data show that the primary tank average wall thickness values exceed the nominal values specified in the design documents. The UT data, when compared to construction specifications, drawings, standards, and codes (241-AN Double-Shell Tanks Integrity Assessment Report, Jensen 1999), reveal that the as-found condition of the tank plates and welds are all within the allowable design limits. A summary of the results associated with the areas examined is presented below.

Primary Tank Wall: Two parallel strips, each ~33 feet long and 17 inches wide, encompassing Plate #1 through Plate #5 were examined. The average ((scan 1 + scan 2)/2) plate wall thicknesses ranged from 101.6% of nominal (plate #5), to 105.8% of nominal (plate #1). The overall average plate wall thickness (of the 5 plates) was 104% of nominal. The average ((scan 1 + scan 2)/2) minimum wall thickness values detected ranged from 98.2% of nominal (Plate #5) to 100.3% of nominal (Plate #2). The overall average minimum plate wall thickness was 99.6% of nominal. Of the 12 inch long vertical wall plate scans yielding minimum thicknesses falling below the nominal values, the greatest thickness deviation was 2.2% below the nominal (Plate #3, Scan 1). No reportable wall thinning, pitting indications or crack-like indications were found.

Figure 11-1. Scan Data Average Wall Thickness Compared to Nominal Plate Thickness

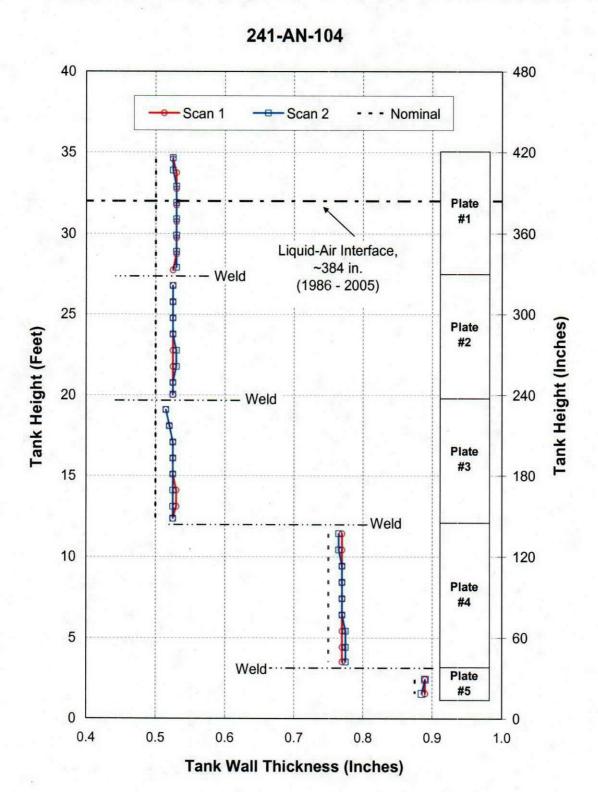


	Table 11-1. Average Talik Wall Thickness Values							
Scan Description	Scan Location	Scan 1 Average (inches)	Scan 2 Average (inches)	Average Thickness (inches)	Nominal Thickness (inches)	Average minus Nominal (inches)		
	Plate #1	0.5288	0.5288	0.5288	0.500	+ 0.029		
Vertical	Plate #2	0.5250	0.5250	0.5250	0.500	+ 0.025		
Wall	Plate #3	0.5244	0.5231	0.5238	0.500	+ 0.024		
Scans (1)	Plate #4	0.7700	0.7706	0.7703	0.750	+ 0.020		
	Plate #5	0.8900	0.8875	0.8888	0.875	+ 0.014		
Liquid / Air Interface	Plate #1	0.5336	n/a ⁽²⁾	0.5336	0.500	+ 0.034		
Primary Lower Knuckle	Knuckle	0.9462	n/a	09462	0.875	+ 0.071		
	Plate #2	0.5200	n/a	0.5200	0.500	+ 0.020		
Vertical	Plate #3	0.5200	n/a	0.5200	0.500	+ 0.020		
Welds	Plate #4	0.7556	n/a	0.7556	0.750	+ 0.006		
	Plate #5	0.900	n/a	0.900	0.875	+ 0.025		
Primary Lower Knuckle Weld	Plate #5 Side	0.8987	n/a	0.8987	0.875	+ 0.024		
	Knuckle Side	0.9327	n/a	0.9327	0.875	+ 0.058		

Table 11-1. Average Tank Wall Thickness Values

Primary Tank Wall Historical Liquid-Air Interface: A horizontal strip (~21 feet long by 17 inches wide) encompassing the Plate #1 historical liquid-air interface (384 inch level) was examined. The average wall thickness detected during the liquid-air scan was 106.7% of nominal, in good agreement with the 105.8% reported above for the plate #1 vertical wall scan. The average minimum plate thickness value detected was 101.2% of nominal. Of the 12 inch long horizontal interface scans yielding minimum thicknesses falling below the nominal (0.500 inches), the greatest deviation was 0.4% below nominal. No reportable thinning, pitting or crack-like indications were found.

Primary Tank Vertical Welds: One vertical weld in each of the four plates #2 through #5 was examined. The average thicknesses of the plate walls adjacent to the welds ranged from 100.8% of the nominal plate thickness (plate #4 HAZ), to 104.0% of nominal (plate #2 HAZ). The overall average thickness of the four vertical weld HAZs was 102.9% of the nominal plate thickness values. The average minimum thickness of the plate walls adjacent to the welds ranged from 96.4% of nominal (Plate #3 HAZ) to 98.6% of nominal (Plate #5 HAZ). The overall average minimum thickness of the four vertical weld HAZs was 97.1% of nominal. Of the 12 inch long vertical weld scans yielding minimum thicknesses falling below the nominal, the

⁽¹⁾ Scan 1 and Scan 2 were on the same plate, unless otherwise noted.

⁽²⁾ n/a – not applicable (only one scan performed)

greatest deviation was 7.4% below nominal (Plate #3 HAZ). No crack-like indications were found. There were also no reportable wall thinning or pitting indications found.

Primary Tank Knuckle-to-Shell Weld: A 20.89 foot long region of the horizontal knuckle-to-shell weld was examined. No crack-like indications were found. There were also no reportable wall thinning or pitting indications found. The average thickness of the horizontal knuckle-to-plate#5 weld HAZ ranged from 102.7% of nominal (plate-side scan), to 106.6% of nominal (Knuckle-side scan). The overall average thickness of the horizontal weld HAZ was 104.7% of nominal. The average minimum thickness of the horizontal weld HAZ ranged from 97.3% of nominal for the plate-side scan, to 102.9% of nominal for the knuckle-side scan. The overall average minimum thickness of the horizontal weld HAZ was 101.3% of nominal. Of the 12 inch long horizontal weld scans yielding minimum thicknesses falling below the nominal, the greatest deviation was 2.6% below nominal (plate-side scan).

Lower Primary Knuckle Wall: A horizontal strip (20.8 feet long by approximately 10 inches wide) along the lower primary knuckle was examined using the P-scan system. The average thickness was found to be 108.1% of nominal. The average of the minimum thicknesses detected was 103.7% of nominal.

Four vertical strips, aligned with four different air slots, along the lower knuckle were examined using the P-scan system. Each strip was approximately 7 inches long by ~0.9 inches wide. The average thickness found during the vertical scans was 110.9% of nominal. The average of the minimum thicknesses detected was 109% of nominal.

All of the knuckle areas that were examined had minimum thicknesses that exceeded the nominal thickness of 0.875 inches. There were no reportable thinning, pitting, or crack-like indications found during the lower knuckle examination.

11.2 DST ULTRASONIC INSPECTION DATA RESULTS COMPARISON

The following Tables 11-2 and 11-3 provide a summary of primary tank vertical wall inspection results and a comparison of primary tank wall thinning.

Table 11-2 reports the inspection results chronologically according to fiscal year (October 1 through September 30).

Table 11-2. Double-Shell Tanks Chronological Inspection Results Findings

Tank	Inspection Year (FY)	Reportable Plate Crack Indication	Reportable Plate Pitting	Reportable Plate Thinning	Reportable Weld Thinning, Pitting or Cracking
AW-103	1997	None	None	None None	
AN-107	1998	None	None	None	None
AN-106	1999	None	None	None	None
AN-105	1999	None	None	Two very minute areas of a plate (20% maximum reduction in thickness) (a)	None
AZ-101	1999	None	None	One area of a plate (11.4% maximum reduction in thickness)	None
AY-102	1999	None	None	None	None
AP-107	2000	None	None	None	None
AP-108	2000	None	None	Two minute areas of a plate (13.8% maximum reduction in thickness).	None (b)
AW-101	2001	None	None	A pit like indication in a very minute area of a plate (16% maximum reduction in thickness).	None
AW-105	2001	None	None	None	None
AY-101	2001	None	Pit-like indication at historical liquid-air interface	Some pit-like indications identified as thinning	Three areas of 10% wall thinning in vertical welds
AN-102	2001	None	None	One minute area of a plate (11% maximum reduction in thickness)	None
AN-101	2002	None	None	One small area of a plate (12 % maximum reduction in thickness)	Four local areas near vertical welds (14% maximum reduction in thickness)

(Cont. on next page)

Table 11-2. (Cont.) Double-Shell Tanks Chronological Inspection Results Findings

Tank	Inspection Year (FY)	Reportable Plate Crack Indication	Reportable Plate Pitting	Reportable Plate Thinning	Reportable Weld Thinning, Pitting or Cracking	
AW-106	2002	None	None	One small area	10.4% maximum reduction in thickness	
AY-101	2002	Not Investigated	None	72 areas of >10% wall thinning, most in the historical liquid-air interface in Plate #2 (20.2% maximum reduction in thickness)	Not Investigated	
AW-104	2002	None	None	None	None	
AW-102	2002 & 2003 ^(c)	None	None	None	None	
AN-105	2002	None	None	None	Not Investigated	
AP-101	2003	None	None	None	None	
AP-105	2003	None	None	None	None	
AP-103	2003	None	None	None	None (d)	
AZ-102	2003	None	None	Six small areas in the vicinity of the liquid-air interface in Plate #2 (13.2% to 17.8% maximum reduction in thickness)	Three small areas of wall thinning near the Plate #1 vertical weld (10.9% to 16.8% maximum reduction in thickness)	
SY-103	2004	None	None	Six small areas in the Plate #1 Vapor Space (10.4% to 12.8% maximum reduction in thickness)	None	
SY-101	2004	None	None	Numerous areas in the vicinity of the historical liquid-air interface on Plate #1 (10.4% to 18.4% maximum reduction in thickness)	Numerous areas in Plate #1 and two areas in Plate #2 (10.6% to 17.3% maximum reduction in thickness)	
SY-102	2004	None	None	Numerous areas in Plate #1 (10.1% to 12.5% maximum reduction in thickness)	One small area in Plate #1 (10.7% maximum reduction in thickness)	

(Cont. on next page)

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Tank	Inspection Year (FY)	Reportable Plate Crack Indication	Reportable Plate Pitting	Reportable Plate Thinning	Reportable Weld Thinning, Pitting or Cracking
AP-104	2004	None	None	None	None
AP-106	2005	None	None	None	None
AP-104	2005 ^(e)	Not Investigated	None	None	Not Investigated
AP-102	2005	None	None	Two areas of plate #2 (14% maximum reduction in Thickness).	Five areas of thinning in the HAZ of plate #4 (13% maximum reduction in thickness).
AN-103	2005	None	None	None	None
AN-104	2005	None	None	None	None

Table 11-2. (Cont.) Double-Shell Tanks Chronological Inspection Results Findings

The inspection results in Table 11-2 show that the overall condition of the inspected tanks is satisfactory. Wall thickness data gathered from ultrasonic examination of twenty-seven DSTs were compared to evaluate the degree of wall thinning that may have occurred among the tanks examined. These wall thickness data do not allow a direct calculation of wall thinning, since no measurements were made of original plate thicknesses at the time of construction. However, wall thickness data from ultrasonic testing may be compared to the specified nominal plate thickness.

Table 11-3 provides a summary of wall thinning, defined as nominal plate thickness minus average minimum plate thickness³, by nominal plate size, and by DST examined. The data used the minimum wall thickness in each scanning area (generally 12 inches by 15 inches) from the vertical wall scans and then calculated the average for each plate using the minimum thickness values. The negative values in the table indicate where the average of all minimum values of plate thickness exceeds nominal plate thickness. The Table also provides the calculated average wall thinning and associated standard deviation by DST examined for all nominal plate thicknesses, and by nominal plate thickness for all DSTs examined.

Tank 241-AN-104 did not exhibit any significant thinning.

⁽a) Based on a review of the tank 241-AN-105 data gathering technique in FY 1999, prompted by the FY 2002 results, the FY 1999 wall thinning data is considered questionable.

⁽b) Although below reporting criteria at the time, one linear crack-like indication 6 inch long by 0.142 inch deep in a nominal 0.750 inch thick plate was observed. Subsequent examination of tank 241-AP-108 in FY 2002 revealed no change in size.

⁽c) Primary knuckle examination using T-SAFT conducted in FY 2003.

⁽d) One linear crack-like indication 2.92 inches long in the weld heat-affected zone of a nominal 0.875 inch thick plate was detected. A follow-up inspection determined that the indication is a small area of incomplete fusion that is not open to either surface of the tank.

⁽e) Primary tank upper knuckle examination only.

³ Average minimum plate thickness is defined as the average of all the minimum measured thicknesses for each scanning area (generally 12 inches by 15 inches) for a given plate size and DST.

Table 11-3. Tank Wall Thinning By Nominal Plate Size

DST	FY Examined	Wall Thinning* By Nominal Plate Size (Inches)						
<i>D</i> 31		0.375"	0.500"	0.5625"	0.750"	0.875"	AVG	STD DEV
AN-101	2002	n/a	0.008	n/a	0.027	0.015	0.013	0.014
AN-102	2001	n/a	0.004	n/a	0.003	0.005	0.004	0.016
AN-103	2005	n/a	0.026	n/a	0.007	0.001	0.019	0.032
AN-104	2005	n/a	0.000	n/a	0.002	0.016	0.002	0.006
AN-105	1999	n/a	0.026	n/a	0.007	0.001	0.019	0.032
AN-105	2002	n/a	0.015	n/a	n/exam.	n/exam.	0.015	0.021
AN-106	1999	n/a	0.006	n/a	0.015	0.012	0.009	0.009
AN-107	1998	n/a	-0.018	n/a	-0.015	0.013	-0.016	0.017
AP-101	2003	n/a	-0.008	-0.003	-0.002	0.010	-0.004	0.008
AP-102	2005	n/a	0.029	0.056	0.040	0.065	0.040	0.024
AP-103	2003	n/a	0.008	-0.004	-0.009	0.007	0.000	0.012
AP-104	2004	n/a	-0.006	-0.016	-0.016	0.011	-0.010	0.014
AP-105	2003	n/a	0.004	-0.006	-0.002	0.010	0.000	0.009
AP-106	2005	n/a	-0.007	0.006	-0.012	0.012	-0.004	0.012
AP-107	2000	n/a	-0.011	-0.012	-0.017	-0.013	-0.013	0.008
AP-108	2000	n/a	-0.017	-0.012	-0.011	-0.005	-0.014	0.016
AW-101	2001	n/a	0.008	n/a	0.014	0.020	0.010	0.013
AW-102	2002	n/a	-0.019	n/a	-0.006	0.008	-0.014	0.012
AW-103	1997	n/a	-0.010	n/a	-0.005	0.004	-0.007	0.008
AW-104	2002	n/a	-0.036	n/a	-0.031	-0.007	-0.033	0.011
AW-105	2001	n/a	0.000	n/a	0.008	-0.003	0.002	0.018
AW-106	2002	n/a	-0.004	n/a	0.015	0.000	0.001	0.016
AY-101	2001	-0.011	0.030	n/a	0.018	0.012	0.030	0.029
AY-102	1999	-0.021	0.001	n/a	0.008	n/a	0.000	0.012
AZ-101	1999	0.021	0.027	n/a	0.020	0.003	0.024	0.011
AZ-102	2003	0.017	0.007	n/a	-0.011	-0.004	0.002	0.019
SY-101	2004	0.056	0.009	n/a	0.026	-0.030	0.015	0.020
SY-102	2004	0.042	0.007	n/a	0.009	0.031	0.012	0.014
SY-103	2004	0.041	0.008	n/a	0.019	-0.022	0.012	0.015
	AVG:	0.021	0.002	0.001	0.005	0.007		
STD	DEV:	0.028	0.022	0.023	0.020	0.019		

^{*} Thinning = nominal plate size – minimum thickness n/a – not applicable; n/exam. – not examined

12.0 FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

The findings, conclusions, and recommendations from the UT inspection of DST 241-AN-104 are listed below.

Primary Tank Walls

- There were no areas of reportable wall thinning, pitting, or crack-like indications detected during the primary tank vertical wall scans.
- The primary wall vertical scans yielded an overall average ((scan 1 + scan 2)/2) wall thickness value of 104% of nominal. The overall average ((scan 1 + scan 2)/2) minimum wall thickness value was 99.6% of nominal. Of the 12 inch long vertical wall plate scans yielding minimum thicknesses falling below the nominal values, the greatest deviation was 2.2% below the nominal (Plate #3, Scan 2).

<u>Liquid / Air Interface</u>

- There were no areas of reportable wall thinning, pitting, or crack-like indications detected during the primary tank horizontal wall scan of the historical liquid-air interface.
- The overall average horizontal wall scan thickness value detected was 106.7% of nominal. The average minimum horizontal wall thickness values detected was 101.2% of nominal. Of the 12 inch long horizontal wall plate scans yielding minimum thicknesses falling below the nominal value (0.500 inches), the greatest deviation was 0.4% below the nominal.

Primary Tank Welds

- There were no areas of reportable wall thinning, pitting, or crack-like indications detected during the primary tank weld HAZ scans.
- The primary tank vertical weld scans (plate #2 through #5) and the knuckle-to-shell horizontal weld scan (plate #5 to lower knuckle) yielded overall average wall thickness values that were 102.9% of nominal for the vertical walls HAZ, and 104.7% of nominal for the horizontal knuckle/plate weld HAZ. The overall average minimum weld HAZ thickness value detected was 97% of nominal for the vertical welds HAZ, and 101.3% of nominal for the horizontal weld HAZ. Of the 12 inch long HAZ scans yielding minimum thicknesses falling below the nominal values, the greatest deviation was 7.4% below nominal (plate #3) for the vertical welds HAZ, and 2.6% of nominal (plate-side scan) for the horizontal weld HAZ.

Primary Tank Lower Knuckle

- There were no areas of reportable wall thinning, pitting, or crack-like indications detected during the primary tank lower knuckle scans.
- The knuckle examination included a horizontal strip of the knuckle wall, and four vertical strips of the wall aligned with four different air slots. The average wall thickness detected was 108.1% of nominal for the horizontal scan, and 110.9% of nominal for the vertical scans. The average minimum wall thickness detected was 103.7% of nominal for the horizontal scan, and 109% of nominal for the vertical scans.
- All of the areas of the knuckle that were examined had minimum thicknesses that exceeded the nominal thickness of 0.875 inches.

Conclusions

• Based on the results of this examination (no reportable indications), the material condition of DST 241-AN-104 is satisfactory for continued operation.

Recommendations

 According to a recent Tank Integrity Assessment Project DST Lifecycle Schedule, tank 241-AN-104 is scheduled for its second, standard UT examination in about ten years. Based on the results of this UT examination, it is recommended that this schedule be maintained – there is no reason to perform any near-term follow-up inspections on this tank. Following the second UT examination, inspection parameters such as wall thinning rates can be calculated and used to better quantify and evaluate any continual wall thinning or degradation.

A visual examination of tank 241-AN-104 is scheduled in FY 2010 that will include visually examining the internal primary tank wall.

FY 2006 Activities

• The Hanford Federal Facility Agreement and Consent Order Milestone M-48-15 requires the re-examination (by September 30, 2007) of six DSTs that have been previously examined. Accordingly, DSTs AN-107, AW-103, and AY-102 are scheduled for UT re-examination in FY 2006.

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ATTACHMENT 1

AUTOMATED ULTRASONIC EXAMINATION FOR CORROSION AND CRACKING

(COGEMA Engineering Corporation Procedure COGEMA-SVUT-INS-007.3, Rev. 2 Effective: December 16, 2003)

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AUTOMATED ULTRASONIC EXAMINATION FOR CORROSION AND CRACKING

1.0 PURPOSE

This procedure establishes the method, equipment, and requirements for automated, direct contact, ultrasonic test (UT) straight-beam, thickness measurements, angle beam flaw detection, and sizing, in carbon steel waste storage tanks utilizing the "P-scan" ultrasonic imaging system.

2.0 SCOPE

2.1 Requirements

The requirements herein are applicable to weld inspection, crack detection, sizing, wall thickness measurement, and the detection of wall thinning conditions, such as pitting, erosion, and corrosion in double shell tanks from 0.100 inches to 1.0 inch in thickness. At least one side must be accessible and the component surface to be measured must be parallel with the opposite surface. The requirements are also applicable to the automated UT detection and depth sizing of surface connected planar flaws.

2.2 Scanning

Scanning is performed using remotely controlled automatic scanners.

2.3 Examinations

Examinations shall be performed from inside the annulus of the double shell tanks.

2.4 Instructions

This procedure provides the instructions for the use of Tip Diffraction Techniques including the Absolute Arrival Time Technique (AATT), and the Relative Arrival Time Technique (RATT), for the sizing of planar flaws.

2.5 Methodology

The methodology in this procedure meets the requirements as addressed in Reference 4.1 as applicable to meet the requirements for inspection of double shell tanks.

3.0 RESPONSIBILITIES

Only certified Level II or Level III ultrasonic examiners shall interpret data to determine whether it represents relevant or non-relevant indication in accordance with the applicable specification. Level III ultrasonic examiners shall review all data collected prior to issuing a final report.



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AUTOMATED ULTRASONIC EXAMINATION FOR CORROSION AND CRACKING

4.0 REFERENCES

- 4.1 ASME Boiler & Pressure Vessel Code, Section V, Article 4, 1995 Edition.
- 4.2 COGEMA SV-CP-PRC-014, Qualification and Certification OF NDE Personnel.
- 4.3 COGEMA SVAD-PRC-001, Nondestructive Examination Administrative Procedure.
- 4.4 COGEMA SVUT-PRC-007, Ultrasonic Examination Procedure.
- 4.5 FORCE Institutes, P-scan System 4 Instruction Manual

5.0 PERSONNEL REQUIREMENTS

5.1 Personnel Qualifications

Personnel performing or supervising data acquisition or performing data analysis to the requirements of this procedure shall be qualified and certified to at least level II in ultrasonics in accordance with reference 4.2 or equivalent. In addition, they shall be trained in techniques for sizing stress corrosion cracking/planar flaws.

5.2 Certification Level

Personnel performing review for final acceptance of examination data shall be certified to at least level II in ultrasonics in accordance with reference 4.2 or equivalent.

5.3 Support Personnel

Personnel, whose responsibilities are limited to set-up, tear down, and track or scanner operation need not be certified. Such personnel shall possess sufficient knowledge of the equipment to satisfy the Level III examiner.

6.0 EQUIPMENT

6.1 Ultrasonic Instrument/Examination System

The P-scan computerized pulse-echo ultrasonic inspection system shall be used. The system shall be equipped with a stepped gain control in units of 1dB with a dynamic range of at least 115 dB, capable of generating and receiving frequencies in the range of 0.5 to 15 MHz. The following components may be used:



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PS-4	P-scan processor
Analysis computer	Off-line data analysis with P-scan analysis software
Digital Controller, WSC-2S, or other approved scan controller	Automatic scanner controller
AWS-5, AWS5-D, RUTI*	Automatic P-scan scanner
Pump	Couplant pump for P-scan system

^{*}Remote Ultrasonic Test Instrument (RUTI) system

6.2 Transducers

Straight-beam and angle-beam transducers with single or dual elements, with or without delay tips, may be used, provided they can be attached to and manipulated by the scanner, and can be adequately coupled to the test item with a resultant backwall signal response of at least a 2 to 1 signal-to-noise ratio. Sizes and frequencies shall be as specified for the following applications:

- 6.2.1 For high sensitivity applications such as the detection of pitting, erosion or corrosion, transducer sizes in the range of 1/4 inch to 1/2 inch, with a frequency in the range of 4.0 to 10 MHz, shall be used.
- 6.2.2 For weld inspection, detection and sizing of planar flaws that are open to the surface, angle beam transducers with a nominal angle of 45°, with an element size in the range of 1/4 inch to 1/2 inch, and with a frequency in the range of 4.0 to 10 MHz, shall be used. Where interference from weld geometry prevents examination of the required volume with a 45° transducer, a 60° angle may be substituted.
- 6.2.3 Transducers of other angles, element sizes, modes of propagation, or frequencies outside the above ranges may be used to suit other required examination techniques.

6.3 Cables

- 6.3.1 Cables of any compatible type and number of connectors may be used for examination. The length shall be limited to 400 feet, or less where signal degradation occurs. The same cables shall be used for calibration and examination.
- 6.3.2 The scanner control cable for analog scanners shall be limited to 330 feet maximum. Digitally controlled scanners shall have a maximum cable length as stipulated by the manufacture's recommendation.



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6.4 Couplant

- 6.4.1 Site approved water should be used as couplant for the examination.
- 6.4.2 Couplant application should be accomplished by means of an automatic couplant delivery system whenever possible. Care should be taken to use only as much water as required, as excess water in the annulus is undesirable.

6.5 User Calibration Blocks

- 6.5.1 For general thickness measurements, or the detection of pitting, erosion, or corrosion, user calibration blocks shall be made of an acoustically similar material as that being measured. A standard step block with 0.1 inch or greater increments encompassing the nominal thickness to be measured shall be used.
- 6.5.2 For weld inspection, crack detection and sizing measurements, user calibration blocks shall be made of an acoustically similar material as that being measured. A standard notched block with 0.1 inch or greater increments encompassing the nominal thickness to be measured shall be used.

6.6 Reference Blocks

Reference blocks (e.g., Rompas, IIW, DSC) utilized for beam angle exit point determination or screen width calibration shall be of similar material composition as the component under examination.

6.7 Pulse Repetition Rate

The repetition rates are set at rates such that signal wrap-around does not occur. In addition, the rates are sufficient to pulse the transducer at least six times within the time necessary to move one-half the transducer dimension parallel to the scan direction at maximum scanning speed.



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7.0 CALIBRATION

7.1 Verification of Instrument Linearity

Instrument alignment verification for screen height and amplitude control should be performed within three (3) months prior to use of the instrument or at the beginning and end of each outage period, whichever is less. Instrument linearity verification is independent of transducer or scanner characteristics. Verification with one transducer/scanner combination is valid for any other combination. The due date for alignment verification shall be recorded on the calibration sheet.

7.2 System Parameters

The system parameters used for calibration and examination should be established as outlined in Reference 4.5 as required. The system should be operated in the T-SCAN program for thickness mapping and zero degree inspection and in the P-SCAN program for crack detection, weld inspection and/or additional evaluation.

7.3 General Requirements

- 7.3.1 Calibration shall include the <u>complete ultrasonic examination system</u>. Any change in transducers, wedges, couplants, cables, instruments, recording devices, scanners, power source, personnel, or any other parts of the examination system shall be cause for system calibration check.
- 7.3.2 If a secondary ultrasonic system is to be used, it must be calibrated before the inspection is started and not removed from the examination system during the inspection or recalibration will be required.
- 7.3.3 System calibration checks and final calibration for instrument sensitivity and sweep range shall be performed on the same block used for initial calibration using at least one reflector. These checks shall be performed:
 - a) At the start and finish of each series of examinations.
 - b) At intervals not to exceed 16 hours.
 - c) When there is a change as described in 7.3.1.
 - d) If the examiner suspects a malfunction.
- 7.3.4 If the horizontal sweep, thickness, or "Z" positions have changed more than <u>5 %</u> of the nominal thickness, void all examinations performed after the last valid calibration verification, and reexamine the voided areas.
- 7.3.5 <u>Calibration checks</u> may be performed on either a reference block or the basic calibration block, but must include a check of the entire examination



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system. Calibration checks may be accomplished by static or dynamic calibration.

- 7.3.6 Simulated calibration checks may be used in lieu of calibration checks where the spread of contamination or serious time constraints would result from performing a standard calibration check. Simulated calibration will use blocks, cables, or transducers of similar types and lengths as those used for testing and will be documented on the calibration data sheet. A baseline, simulated calibration shall be performed immediately after performing the initial calibration, or after a calibration check where the entire examination system is utilized. The initial simulated calibration check values are independent of the values obtained utilizing the entire examination system. The established tolerance applies to the subsequent simulated calibration checks.
- 7.3.7 During calibration, the temperature of the calibration block should be within 25 degrees Fahrenheit of the ambient inspection temperature.
- 7.4 Calibration Process for Thickness Mapping / T-scan

The basic process for calibration is the same for thickness mapping (T-scan), weld inspection, flaw detection, and sizing. The calibration reflectors for straight beam are the backwall reflections from a step wedge. The reflectors for angle beam transducers are the notch base and tips from a notched block. The calibration process is as follows:

- 7.4.1 Select and connect the appropriate transducer(s), input the parameters, including thickness, frequency, index delay, gates, inspection method(s), and velocity. Apply the couplant to the applicable points on the calibration standard. (Select a sufficiently thin step for detection of unexpected low reading or pits and a step greater than the maximum thickness expected.)
- 7.4.2 Place the transducer(s) on the 1.00" calibration step and adjust the gain control to produce a reflection of 80% full screen height (FSH). Input this gain level as the reference level. Obtain a response from the 0.300" calibration step, and verify that it produces an acceptable signal. Other thickness ranges may be used for system calibration. Initial calibration accuracy will be within +/- 0.010" in T-scan. Record reading on the Automated Ultrasonic Thickness Calibration Sheet (Attachment 1).
- 7.4.3 The vital parameters used for the calibration shall be identical to the inspection parameters with the exceptions of file name(s), X, Y and Z ranges, reference level compensations, thickness, gates or comment parameters which may be adjusted as required.



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- 7.5 Calibration Process for Weld Inspection / Crack Detection / P-scan
 - 7.5.1 Select and connect the appropriate transducer(s), input the parameters, including thickness, frequency, index delay, gates, inspection method(s), and velocity. Apply the couplant to the applicable points on the calibration standard. The 5%T notch on a 1" thick plate should be used to obtain the reference level.
 - 7.5.2 Manipulate the transducer to receive the maximum response from the reference notch. Adjust the gain control to produce a reflection of 80% full screen height (FSH). Input this value as the reference level. Obtain a response from the calibration reflector and verify that the response is within +/- 2dB.
 - 7.5.3 Repeat step 7.5.2 as required for each transducer until the system is calibrated.
 - 7.5.4 The vital parameters used for the calibration shall be identical to the inspection parameters with the exceptions of file name(s), X, Y and Z ranges, reference level compensations, thickness, gates or comment parameters which may be adjusted as required.
- 7.6 Sizing Calibration for Tip Diffraction Techniques (AATT, RATT)
 - a) Select an appropriate transducer.
 - b) Select a sizing calibration block of similar thickness and material containing at least two notches of known depths.
 - c) For the AATT technique, set at least two gates, to cover the entire area of interest. The first gate in the first leg, ending just before the ID. Position the transducer on the calibration block. Alternately peak the shallow and deep signals from the notch tips (see Figure 1, Attachment 2). Using the index delay and velocity controls, adjust the system until the system correctly reads the remaining ligament with the "Z" cursor.
 - d) For the RATT technique, the system mode should be set to A-SCAN.

 Manipulate the transducer until signals are obtained from the shallow notch tip and the notch base simultaneously (see Figure 2, Attachment 2). Using the index delay and velocity, adjust the distance between the two signals to read the actual reflector depth in inches. Repeat the same process on the deep notch. Alternate this procedure until the screen/system represents a desirable linear depth screen in inches.



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e) Save the calibration, and record this data on the Automated Ultrasonic P-Scan Calibration Sheet (Attachment 3).

8.0 EXAMINATION

8.1 Surface Condition

- 8.1.1 The surface from which measurements are to be taken should be free of loose scale, unbonded coating, heavy oxidation, weld spatter, or other material which may interfere with movement of the transducer or the transmission of sound into the material.
- 8.1.2 A surface finish of 250 RMS or better should be provided. The requesting organization must approve the use of any base material preparation process, which may reduce the thickness below the allowable tolerance.

8.2 Extent of Examination

The location of the areas to be measured and/or the number of scans to be performed shall be designated by the applicable work instructions. The location, scan numbers, and reference points of all scans shall be recorded on the applicable data sheets. See Attachment 4 for minimum examination volume and beam direction for weld inspection.

NOTE: Additional scan areas will not require revision to this procedure.

8.3 Flaw Location

When performing examinations to detect planar flaws, angle beam transducers shall be used. Calibration is performed as in Section 7.5. All angle beam examinations shall be performed in P-scan.

8.4 Ultrasonic Measurement

User calibration shall have been completed per the applicable requirements of Section 7.0 prior to performing any of the examinations.

- 8.4.1 Transducer overlap between passes shall be a minimum of <u>50%</u> of the element size. Scanning speed shall not exceed <u>6</u> inches per second.
- 8.4.2 Should measurements be observed larger or smaller than the calibration range, check the calibration for accuracy in the encountered thickness range. If the calibration is accurate in this range, amend the calibration sheet and continue the examination. If the calibration is not within the



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tolerance allowed in the spec, then <u>recalibrate and rescan</u> all areas where readings were encountered outside the originally calibrated range.

8.5 Limitations and Precautions

- 8.5.1 Care must be taken to ensure the transducer face is flush with the examination surface during scanning.
- 8.5.2 When it is necessary to determine the origin of mid-wall indications, a 4MHz shear wave transducer(s) may be used in the P-Scan program to detect pit openings or perpendicular connections between laminar indications.

8.6 Recording

Upon completion of each scan area, the data file(s) shall be recorded on a disk. All measurements within the predetermined gated area are stored, along with the text information with each file.

8.7 General Sizing Guidelines

- 8.7.1 It is recognized that, of the methods of sizing described in this procedure, no one technique is completely accurate in sizing all flaws in all thicknesses. By using complementary methods, however, a realistic approximation of the flaw depth can be obtained.
- 8.7.2 The method of sizing pits is primarily utilizing a 0° dual element transducer. The 45° shear wave transducers may be used to confirm qualitatively the depth of the pit.
- 8.7.3 When sizing crack-like indications, the entire flawed area shall be scanned with the imaging mode. The entire flaw length shall be evaluated. It is recommended that A-Scans be recorded at the <u>deepest</u> location of the flaw. The primary technique for sizing crack-like indications is the high frequency, 45° shear wave transducer utilizing the Absolute Arrival Time Technique (AATT). The dual element, straight beam may be used as a complimentary technique.
- 8.7.4 Additional sizing technique sequences may be utilized if the primary techniques identified prove to be indeterminable.



AUTOMATED ULTRASONIC EXAMINATION FOR CORROSION AND CRACKING

- 8.8 Sizing with Tip Diffraction Techniques (AATT, RATT)
 - 8.8.1 The AATT technique uses shear waves to obtain a diffracted echo (satellite pulse) from the flaw tip (see Figure 1, Attachment 2). The RATT technique uses shear wave reflected signals from both the flaw tip and the flaw base (see Figure 2, Attachment 2). Both techniques can be utilized using the same transducer.

a) AATT Technique

Locate the deepest extremity of the flaw and maximize the signal from the flaw tip. The distance to the flaw tip represents the remaining material ligament from the outside surface. To determine the relative through wall flaw depth, subtract this dimension from the local material wall thickness.

b) RATT Technique

Locate the deepest extremity of the flaw, and obtain a signal from the flaw base. Manipulate the transducer until the doublet (flaw base and tip signal appearing simultaneously) is observed. These signals do not have to be peaked, as the doublet separation directly indicates the relative through wall depth. To determine remaining material ligament, subtract the relative through wall depth measurement from the local material wall thickness.

8.8.2 Other sizing techniques or variations to the techniques may be used with the approval of the UT Level Ill. Such approval, signature and a description of the technique shall be recorded in the "Remarks" column on the Automated Ultrasonic P-Scan Calibration Sheet (Attachment 3).

9.0 EVALUATION

9.1 Relevant Indications

Relevant Indications, including pitting, thinning and crack-like indications, along with the minimum thickness reading in the area of interest, shall be recorded and used for evaluation per Paragraph 9.2.

9.1.1 P-scan data shall be evaluated to a sensitivity of 20% reference level (-14dB). All crack-like indications are recordable regardless of amplitude.



AUTOMATED ULTRASONIC EXAMINATION FOR CORROSION AND CRACKING

- 9.1.2 T-scan data shall be evaluated utilizing all available images to detect and evaluate indications.
- 9.1.3 Reportable indications shall be evaluated by Level III personnel prior to final report submittal.

9.2 Reporting/Special Criteria

Reporting and special notification criteria are noted in Section 9.8.

9.3 Statistical Information

The statistical information (Minimum and Mean thickness) provided under "Setup" pages 1 & 2 of the post-processing software should be reported for each "Part" of a given scan location. Where data noise invalidates these values, the analyst should determine the values using the level control.

9.4 Printouts

Printouts should be made in accordance with the customer's request. In absence of further direction, both the merged set-up pages and the merged image, adjusted to show the minimum thickness, shall be printed at a level that best shows the wear patterns or at Nominal T - 10.0%, whichever provides the most useful information. P-scan data should be printed with the level control set at 20% reference level (-14dB).

9.5 Recording Crack Size

- 9.5.1 All flaw sizing data acquired should be used to determine the flaw depth. This data shall be reported individually for each flaw and shall include all data necessary to achieve the best accuracy of flaw depth.
- 9.5.2 If, during sizing, a <u>flaw length other than that reported during the detection examination</u> is measured, or other discrepant conditions occur, record the corrected lengths, locations. or distances on the Automated Ultrasonic P-scan Data Report (Attachment 5) in the spaces provided.
- 9.5.3 If, during sizing, the area is determined <u>not to be flawed</u>, and the resultant reflector(s) is due to component/weld geometry or metallurgical structure, the true origin (e.g., root, mismatch, etc.) shall be documented and substantiated on the Ultrasonic P-scan Data Report.



AUTOMATED ULTRASONIC EXAMINATION FOR CORROSION AND CRACKING

9.6 Scanning Limitations

Record all limitations due to weld configurations, obstructions, single side access restrictions, etc., in the remarks section on the applicable Ultrasonic Data Report. Details as to specific length or area in relation to L (X) and/or W (Y) reference points should be recorded.

9.7 Flaw Evaluation

Reportable indications shall be evaluated by Level III personnel prior to final report submittal.

9.8 Reporting Levels

All indications which meet or exceed the following conditions shall be reported to the project cognizant engineer.

- a) Pit depth exceeds 25% of the wall thickness.
- b) Wall thinning exceeds 10% of the wall thickness.
- c) Surface crack depths exceeding 0.100 inches.



AUTOMATED ULTRASONIC EXAMINATION FOR CORROSION AND CRACKING

10.0 REPORTS

10.1 Thickness Data Reports

An Automated Ultrasonic Thickness Data Report (Attachment 6) shall be prepared for each examination or series of examinations performed. This report shall include identity of equipment, the thickness measurements obtained, and should be referenced to the calibration sheet.

10.2 Calibration Reports

An Automated Ultrasonic Thickness Calibration Sheet (Attachment 1), and an Automated Ultrasonic P-Scan Calibration Sheet (Attachment 3) shall be prepared for each examination or series of examinations performed. These reports shall include the materials and equipment used for examination.

10.3 Sketch Sheets

Automated Ultrasonic Examination Sketch Sheet(s) (Attachments 7 and/or 8) should be prepared for each examination or series of examinations performed. These reports should include a sketch of the component or item examined, identifying scan locations, including dimensions, reference points, and grid locations, where applicable.

10.4 Sizing Data Reports

An Automated Ultrasonic P-Scan Data Report (Attachment 5) shall be completed only when cracking is detected. Each report shall be related to the applicable Automated Ultrasonic Examination Calibration Sheet(s).

10.5 Final Reports

Final reports are to be distributed and maintained in accordance with the applicable contract.



AUTOMATED ULTRASONIC EXAMINATION FOR CORROSION AND CRACKING

11.0 ATTACHMENTS

Attachment 1:	Sample Automated	Ultrasonic	Thickness	Calibration	Sheet
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Attachment 2: Figure 1: Absolute Arrival Time Technique (AATT)

Figure 2: Relative Arrival Time Technique (RATT)

Attachment 3: Sample Automated Ultrasonic P-scan Calibration Sheet

Attachment 4: Examination Volume, Minimum Beam Directions and Extent of

Examination

Attachment 5: Sample Automated Ultrasonic P-scan Data Report

Attachment 6: Sample Automated Ultrasonic Thickness Data Report

Attachment 7: Automated Ultrasonic Examination Sketch Sheet - Tank Walls and

Knuckles

Attachment 8: Automated Ultrasonic Examination Sketch Sheet – Tank Bottom



AUTOMATED ULTRASONIC EXAMINATION FOR CORROSION AND CRACKING

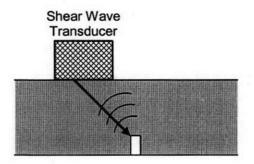
Attachment 1: Sample Automated Ultrasonic Thickness Calibration Sheet

	AUT	Attachment I					Job #	kness Canb	Riser		
		CALIBR	ATION :	SHEET		_					
Location	n:			Syster	n:		alibration Block:				
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Softwar	re Ver	rsion:		·····	Rev.	TI	nickness:		Material:		
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AUTOMATED ULTRASONIC EXAMINATION FOR CORROSION AND CRACKING

Attachment 2: Absolute Arrival Time Technique (AATT) & Relative Arrival Time Technique (RATT)



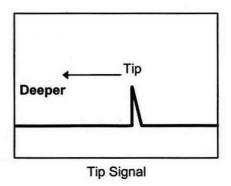
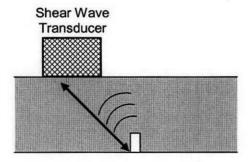
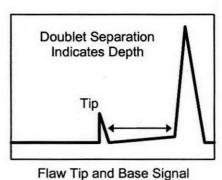


Figure 1. Absolute Arrival Time Technique





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Figure 2. Relative Arrival Time Technique



AUTOMATED ULTRASONIC EXAMINATION FOR CORROSION AND CRACKING

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Scanne	er Cabl	e:				 -	Ca	Cable Length:					
Signal	Cable:						Ca	ble Leng	gth:		Feet Feet		
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0° T-Scan

COGEMA-SVUT-INS-007.3, Rev. 2 UNCONTROLLED COPY

AUTOMATED ULTRASONIC EXAMINATION FOR CORROSION AND CRACKING

Attachment 4: Examination Volume, Minimum Beam Directions and Extent of Examination Primary Knuckle Horizontal T-Scan Strip: 0° T-Scan, 20' Length Weld Examination Volume: The examination volume is 1" on each side of the weld for the lower 3/4T. When the probes are parallel to the weld, scan a 1" wide area as close to the toe as possible. 3/4T Weld **Primary Wall Primary Wall** Vertical T-Scan / **Vertical Weld** P-Scan Strips: Inspection: 45° P-Scan 0° T-scan and directions 45° P-scan strips, 0° T-Scan and 2 each 15" 60° P-Scan Secondary Wall **Annulus** Horizontal Weld Inspection: 45° P-Scan 60° P-Scan 0° T-Scan **Primary Primary** Tank Wall **Primary Knuckle** Horizontal T-Scan Strip: 0° T-Scan and 45° P-Scan Secondary Knuckle: 45° P-Scan Primary Bottom Inspection via Slots: 0° T-Scan and 45° P-Scan Secondary Bottom:



AUTOMATED ULTRASONIC EXAMINATION FOR CORROSION AND CRACKING

Attachment 4 (continued): Extent of Examination

Primary Tank Wall

<u>Vertical Strips</u> - Examine a vertical strip 30" x 35 feet long of the primary wall between the upper haunch transition and the lower knuckle for pits, cracks and wall thinning. Axial cracks on the tank inner wall surface shall be detected and sized. The vertical strip may be comprised of one or more strips whose total width is equal to 30 inches.

Weld Areas - Examine 20 feet of horizontal weld area (heat affected zone), at tank to knuckle weld. Examine one ~10 foot section of vertical weld joining the lowest shell course plates and one ~10 foot section of vertical weld joining the next to lowest shell course plates. Axial and circumferential cracks on the tank inner surface shall be detected and sized.

Primary Tank Knuckles

Examine 20 feet of the primary tank lower knuckle in the circumferential direction to detect and size cracking in the circumferential direction and to detect pits and wall thinning. Examine 20 feet of the primary tank upper knuckle in the circumferential direction to detect pits and wall thinning. The areas to be examined are from the welds joining the transition plates with the knuckles to the furthest reach of the transducer assembly that is allowed by geometric constraints.

Secondary Tank

<u>Secondary Tank Lower Knuckle</u> – Examine a 20 foot length of the secondary tank knuckle over the entire area of the knuckle for the presence of circumferential cracks.

<u>Secondary Tank Bottom</u> – Examine the secondary tank bottom over an area of 10 ft² to detect and measure thickness and pits.

Primary Tank Bottom

Examine the primary tank bottom for pits, wall thinning and cracks oriented in the circumferential direction (perpendicular to the air channels) in 16 air channels. The tank bottom is to be examined for a distance of 12 feet towards the tank center, starting seven inches inboard of the outside radius of the tank cylindrical section. The primary tank bottom scan head is designed to examine the accessible area in the air channel in one pass through the channel.



AUTOMATED ULTRASONIC EXAMINATION FOR CORROSION AND CRACKING

Attachment 5: Sample Automated Ultrasonic P-scan Data Report

	ΔΠΤ		ULTRAS			7111430	Job #	in Data I	Rise	er#		
	AUT		TA REPO		OAN							
Loc	ation:			System:		Exa	m Start:		Exa	m End:		
Сог	nponent ID:	Walt Mr					mination Surf		Non D Thic	ninal kness:		
Cor	ifiguration:		TO				brated	то		Temp: OF		
Tota	al Length Exa	mined:		Scan Width	า:		Level Correc	ction (Trans	s. Corr):	DB		
Pro	cedure:		.,	1	Rev.		erial Type:			Condition:		
File	Name				_		SS CS (OTHER:				
/ ite	m #:						DUAL D	SGL □0	DEG [ANGLE:		
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Yo Ref. Point (Wo):												
Sizing Method Angle (deg) Reference Cal. Sheet Set-Up / File Name												
1	45 ⁰ SHEAR											
2	60° SHEAR											
3	AATT											
4	DUAL 0°											
	INDICATION INFORMATION											
Ind.	Method		Depth Ma R. Lig. Am		Length (in)	L2 (in)	W1 (in)	Width (in)	W2 (in)	Indication Type		
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AUTOMATED ULTRASONIC EXAMINATION FOR CORROSION AND CRACKING

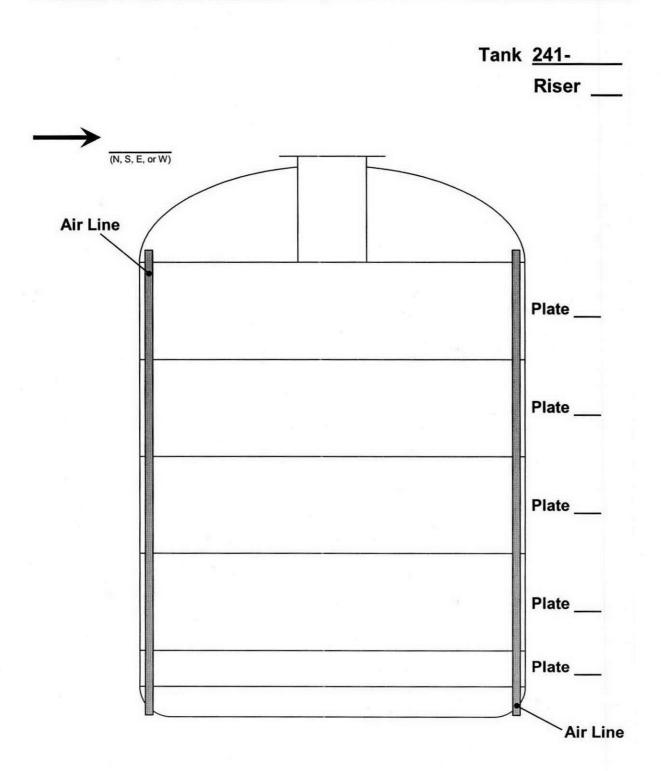
Attachment 6: Sample Automated Ultrasonic Thickness Data Report

	ATED UL		NIC THICK		, itiac	Job #		Riser #		
Location:					Ex	kam Start:		Exam E	nd:	
Component ID:						kamination Surfa	ce:	Nomina Thickne	ess:	
Configuration:		TO			Ra	alibrated ange:	то	1	mp:	°F
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Procedure:				Rev		aterial Type: ☐ SS ☐ CS O	THER:		Condit	ion:
File Name:						ansducer:	3L ⊠ 0 D€	G □ #	NGLE:	0
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Part # / Indication	X Start (in)	X Stop (in)	Y Star (in)		Stop in)	Ave. Thk. (in)	Min. Thk., R. Lig. (in)			Max. Thk. (in)
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Level: Level: Level:										



AUTOMATED ULTRASONIC EXAMINATION FOR CORROSION AND CRACKING

Attachment 7: Automated Ultrasonic Examination Sketch Sheet - Tank Walls and Knuckles





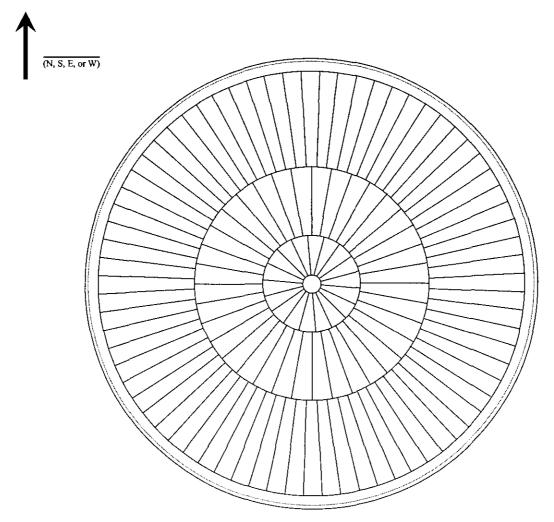
AUTOMATED ULTRASONIC EXAMINATION FOR CORROSION AND CRACKING

Attachment 8: Automated Ultrasonic Examination Sketch Sheet - Tank Bottom

Tank 241-

Typical Air Channels Under Tank Bottom

Note: Flow Path Geometry and Number of Channels Differ from Tank to Tank



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ATTACHMENT 2

COGEMA "AUTOMATED ULTRASONIC THICKNESS DATA REPORT SHEETS"

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AUTOMATED ULTRASONIC THICKNES						Job#		T	Riser#	
		A REPORT				04	4-41		26)
Location:					Exa	ım Start:			Exam End:	· · · · · · · · · · · · · · · · · · ·
	AST TANK	FARM				06/23/05		5		2020
Component ID:	104-AN					ımination Surfa ⊠ OD		D	Nominal Thickness:	500"
Configuration:	PLA	TE TO			1	ibrated nge: 0	.3" то	1.0"	Temp:	AMB ^o F
Total Length Exam	ined: 92.2	, Sc	an Width:	15"	Ref	. Level Correct	ion (Trar	ıs. Co	rr.):	0 DB
Procedure:	GEMA SVU	T-INS-007.3	Re	2		terial Type: SS ⊠ CS 01	THFR:		Cond	ition: N/A
File Name:		Transducer: ☑ DUAL ☐ SGL ☑ 0 DEG ☐ ANGLE:					0			
Xo Ref. Point (Lo):	nned ui		DUAL LIGH		<u>U DEO</u>	C ATOL				
1" above bottom horiz, weld, scanned up Yo Ref. Point (Wo): Center line of 24" riser										
Part # / Indication	X Start (in)	X Stop (in)	Y Start (in)	Y Sto (in)		Ave. Thk. (in)	Min. T R. Lig.		Area Reportable	Max. Thk. (in)
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12-24			· · · · · · · · · · · · · · · · · · ·			.530"	.498	3"		.535"
24-36	·					.530"	.493	3"		.535"
36-48						.530"	.508	3*		.535*
48-60						.530"	.509)"		.535"
60-72		:				.530"	.502	2"		.535"
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P-Scan Limited										

RPP-RPT-26254, Rev. 0

AUTOM.	ATED UL			NESS		Job#	4 44	Riser#	
	DAT	A REPO	RT		.,	L	4-41	2	0
Location: 200 E/	AST TANK	FARM			Exa	am Start: 07/13/05	0813	Exam End:	1430
Component ID:	104-AN					amination Surfa ⊠ OD □ ID [Nominal Thickness:	.500"
Configuration:	PLA	TE TO			Rai		.3" то 1.0		AMB ^o F
Total Length Exam	ined: 89.9)"	Scan Width:	17"	Ref	f. Level Correct	ion (Trans. (Corr.):	0 DB
Procedure: CO(GEMA SVU	T-INS-00	7.3	Rev 2		terial Type:] SS ⊠ CS O	THER:	Con	dition: N/A
File Name:	VER	T.WALL/	PLATE2	<u> </u>	Tra	insducer: ☑ DUAL ☐ SC		EG □ ANGL	o E:
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Yo Ref. Point (Wa): center line of 24" riser									
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0-12						.525"	.499"		.535"
12-24						.525"	.499"		.535"
24-36						.525"	.504"		.585"
36-48						.525"	.503"		.535"
48-60						,525"	.499"		.535"
60-72						.525"	.503*		.535*
72-84						.525"	.499"		.535"
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COGEMA-SVUT-INS-007.3, Rev. 2, Attachment 6

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Procedure:	GEMA SVL	JT-INS-007	.3	Rev	2	Mat	erial Type: SS 🖾 CS O	THER:			Conc	lition: N/A
File Name:	VERT.WALL/PLATE3								0 DEG		ANGLE	0
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Yo Ref. Point (Wo): center line of 24" riser												
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12-24							.520*	.493	}"			.535*
24-36							.525"	.498	}"			.535"
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48-60							.525"	.503	3"			.535"
60-72							.530"	.509	}"			.535"
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Configuration:	104-AN	TO				☑ OD ☐ ID [PAINTED	Tì	nickness:	.750"
	PLA	re "			Ra	nge: 0	.3" то 1.			AMB ^o F
Total Length Exami	^{ned:} 105.	9"	Scan Width:	17"	Re	f. Level Correct	ion (Trans.	Corr.)):	0 DB
Procedure: COC	SEMA SVU	T-INS-00	7.3	Rev 2		iterial Type:]SS ⊠ CS O	THER:		Cond	ition: N/A
File Name:	VER		Transducer: o ☑ DUAL ☐ \$GL ☑ 0 DEG ☐ ANGLE:					. 0		
VERT.WALL/PLATE4 Xo Ref. Point (Lo): 1" below horiz. weld						3 0005 17 (<u> </u>	<u>JLU</u>		
Yo Ref. Point (Wo): center line of 24" riser										
Part # / Indication X Start X Stop Y Start Y Stop Ave. Thk. Min. Thk., Area Max. Thk. (in) (in) (in) (in) R. Lig. (in) Reportable (in)										
0-12						.770"	.744"			.780*
12-24					_	.770"	.744"			.780"
24-36						.770"	.744"			.780"
36-48						.770"	.750"			.780"
48-60						.770"	.753"			.780"
60-72						.770"	.754"			.780"
72-84					.770" .750" .7			.780"		
84-96						.770"	.747"			.780"
96-105.9						.770"	.747"			.780"
		·								
Remarks:										
Peak Data										
	[N1] See Attached Letter From J. B. Elder Xaminer: W. H. Nelson									
Examiner: W. H. I		Examiner:		. I .			F	Review	er: J.B.E	ilder
WHILLES	att Debru (ett Debru 1911									
Level: 111 Date: _(07/18/05	Da	ite:	Le	vel: <u>1</u>	el: <u>III</u> Date: <u>08/08/05</u> Le			III Date:	

RPP-RPT-26254, Rev. 0

AUTOM	AUTOMATED ULTRASONIC THICKNES DATA REPORT						Job# Riser# 26			
Locations	ואט	A IVEL O	111			m Start:	·· · · · · · · · · · · · · · · · · · ·	Exam End:		
	AST TANK	FARM				06/27/05			2047	
	104-AN					amination Surfa 図 OD □ ID [Nominal Thickness:	.875"	
Configuration:	PLA	TE TO	-		Rar	ige.	.3" TO 1.0"	1	AMB ^O F	
Total Length Exam	ined: 20.	89"	Scan Width:	15"	Ref	. Level Correct	ion (Trans. C	·	0 DB	
Procedure: CO	GEMA SVI	JT-INS-00	7.3	Rev 2		terial Type: ISS ⊠ CS O	THER:	Con	dition: N/A	
File Name:	VER	T.WALL/F	PLATE 5		Transducer: o ☑ DUAL ☐ SGL ☑ 0 DEG ☐ ANGLE:					
Xo Ref. Point (Lo):			oriz. weld, s	scanned u		3 00112 230	<u> </u>		<u> </u>	
Yo Ref. Paint (Wo)	•	ne of 24" r		,,						
Part # / Indication X Start X Stop Y Start Y Stop Ave. Thk. Min. Thk., Area Max. Thk. (in) (in) (in) (in) (in) R. Lig. (in) Reportable (in)										
0-12	,					.890"	.864*		.905"	
12-20.89								.905*		
		<u> </u>							<u> </u>	
		_						ļ.,		
					<u> </u>				<u> </u>	
		-						-		
									<u> </u>	
							,		:	
						<u> </u>				
		"								
Remarks:	<u> </u>	•	ľ			1		,		
[N1] See Atta			B. Elder							
Examiner: W. D.	Purdy	Examiner:		Ana	uyst: ╭⁄∖ो	W. H. Nelson	Re	viewer: J. B.	≘lder	
MAH	van	*******		<u>ce</u>	4	1 lebr	[N	1]		
Level: <u>II</u> Date: _	06/27/05	. Da	ıte:	_ Lev	el: <u> </u>	Date: <u>08/09</u>	0/05 Lev	rel: <u>III</u> Date:		
P-Scan Limited										

COGEMA-SVUT-INS-007.3, Rev. 2, Attachment 6

	AUTO	OMATED			CAN	Job# Riser# 26			
		DAT	A REPO					+=+	
Loca	ation;	ACT TANK		System:	PSP-4	Exa	m Start:	0005	Exam End:
Com	ponent ID:	AST TANK	FARIVI		F3F4	Eya	06/23/05 mination Surfa	0905	2025 Nominal
	<u>. </u>	104-AN							Thickness: 0.5000"
	figuration:		ATE TO	PLATE		Ran	g	' то 1.414'	
Tota	l Length Exar	nined: 92.	.1"	Scan Width	15"	Ref.	Level Correcti	ion (Trans. C	Corr): <u>0</u> DB
Proc	Procedure: Rev. Material Type: COGEMA SVUT-INS-007:3 Rev. □ SS ☒ CS OTHER:								Condition: N/A
File Name Transducer:									
/ Item #: VERT.WALL/PLATE 1 □ DUAL ☑ SGL □ 0 Xo Ref. Point (Lo): Started @ bottom horiz.,1" above weld and scanned up								G ⊠ ANGLE: <u>45</u>	
	Ref. Point (Wo	Started (bove weld	and :	scanned up		
Center line of 24"riser									
Sizing Method Angle (deg) Reference Cal. Sheet Set-Up / File Name								File Name	
1	45° SHEAR							<u> </u>	
2	60° SHEAR			<u> </u>				, , , , ,	
3	DUAL 0°				•		<u> </u>		
├-	DUALU	<u> </u>		INDICA	TION INFO	DMAT	10N		
ļ _.		Weld [epth Max		Length	L2	W1	Width	W2
Ind.	Method		Lig. Amp		(in)	(in)	(in)		(in) Indication Type
			ļ						
							<u> </u>		
				<u> </u>					
									
									
									,
lacksquare									
	marks:								
N	lo crack like	e indication	S						
[I	N1] See Att	ached Lette	er From J.	B. Eider					
	miner: (W, D		Examiner:	· · · · · · · · · · · · · · · · · · ·	An	alyst: \	N. H. Nelson	Rev	iewer: J. B. Elder
77	7 D H	udy				4),	Yeb-	<u>[N1</u>	1
Lev	el: <u>II</u> Date:	06/23/05	Da	te:	Le	/el: <u> </u>	Date: <u>08/23/</u>	/ <u>05</u> Lev	el: <u>[]]</u> Date:
P	-Scan Limited	t							

AUTOMATED ULTRASONIC P-SCAN DATA REPORT									Job # Riser # 26				26	
Location: System:									n Start:			Exam Er	nd:	
200 EAST TANK FARM PSP-4									07/13/05		9		1436	
Component ID: 104-AN								Examination Surface: Nominal O.5					s: 0.5000"	
Con	figuration:	Р	LATE	ro PI	LATE			Rang	,-,)" то 1.		Ten	AMB ^O F	
Tota	I Length Exar	nined: 8	9.8"	Sc	an Width:	17'	•	Ref.	Level Correc	ction (Tra	Trans. Corr): 0 DB			
Proc	edure: CO		Rev. 2	:		rial Type: SS ⊠ CS (OTHER:		Condition: N/A					
File / Ite	Name n #:	VI	ERT.WAL	_L/PLA	TE 2				sducer: DUAL 🔯 S	GL □	0 DEG	S ⊠ Al	IGLE: 45°	
X ₀ F	Ref. Point (Lo)	: Started	1 @ 1" be	elow ho	oriz. weld	i								
Y _o F	Yo Ref. Point (Wo): Center line of 24"riser													
	Sizing Metho	od	Angle (de	g)	Referen	ce Cal.	Sheet	t		Set-	Up / F	ile Name		
1	45° SHEAR													
2	60° SHEAR													
3	AATT													
4 DUAL 0°														
	INDICATION INFORMATION													
Ind.	Method	Weld Side	Depth R. Lig.	Max. Amp.	L1 (in)	Lengt (in)		L2 (in)	W1 (in)	Width (in)	,	V2 in)	ndication Type	
		1									-			
		 			ļ <u>.</u>	<u> </u>							· · · · · · · · · · · · · · · · · · ·	
											+			
\vdash			-						<u> </u>					
								-m	-					
													~ ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
1	narks:	<u>-</u>												
N	o crack like	indicatio	ns											
1	N1] See Att	ached Le	tter From	ı J. B.	Elder									
_	miner: W.H.		Examir			l	Analy	st: W	. H. Nelson		Revie	ewer: J. E	3. Elder	
1	1472	2/2	.				le	Des IN						
Lev	el: <u>III</u> Date:	07/13/05	-	Date:		-					Leve	vel: III Date:		

AUTOMATED ULTRASONIC P-SCAN DATA REPORT									Job# Riser # 26			6	
Location: System:								Exam Start: Exam End:					
		AST TAI	VK FARI	1		PSP-4			07/18/05				2051
Component ID: 104-AN								Examination Surface: Nominal Thickness: 0.5000"					
	figuration:		PLATE		PLATE			Rang	,	D" TO 1.4		Temp:	AMB ^O F
Total Length Examined: 89.6" Scan Width: 17"							111	Ref. Level Correction (Trans. Corr): 0 DB					
Procedure: Rev. COGEMA SVUT-INS-007.3 2							2		irial Type: SS ⊠CS	OTHER:	······	Cond	iltion: N/A
	Name n #:	\	/ERT.WA	LL/PI	ATE 3				sducer: DUAL 🔯 :	SGL □	0 DEG	☑ ANGLE	: 45°
	Ref. Point (L ₀)	Starte	ed @ 1" b	elow	horiz. we	ld							
Y _o I	Yo Ref. Point (Wo): Center line of 24"riser												
	Sizing Metho	od	Angle (d	eg)	Refere	nce Cal.	Shee	ŧ		Set-I	Up / File	Name	
1	45° SHEAR												
2	60° SHEAR												
3	AATT												
4	DUAL 0 ⁰												
	INDICATION INFORMATION												
Ind.	Method	Weld Side	Depth R. Lig.	Max. Amp		Leng (in)		L2 (in)	W1 (in)	Width (in)	W2 (in)	i indic	ation Type
													
								_					
		,						·					
						ļ							
Rei	narks:		<u> </u>				!_			1	<u> </u>		
٨	Remarks: No crack like indications												
	N1] See Att				3. Elder						D	. , = ==	
Exa	miner: W. H.	Nelson	Exam	iner:			Anal	yst: W	/. H. Nelson	_	Review [N1]	er: J.B.E	der
Lev	el: III Date:	07/18/05		Date	9;	_	Leve	: Date: _08/23/05 Level: Date:				······································	

	AUT		D ULTR			Job # 04-41			Riser# 26				
Location: System: PSP-4									Exam Start: Exam End:				0054
Component ID:								Evar	07/18/05 nination Surf		Non	ninal	2051
	•	104-AI	N .			_,		X (DD □ ID [kness:	0.7500"
Configuration: TO PLATE PLATE								Rang		0" то 2.1		Temp:	AMB ^O F
Total Length Examined: 106.1" Scan Widt						17	rti		Level Correc	ction (Tran	s. Corr):	 -	DB
Procedure: COGEMA SVUT-INS-007.3							2		erial Type: SS ⊠CS (OTHER:		Cond	ition: N/A
	Name m #:	\	/ERT.WA	LL/PI	LATE 4				sducer: DUAL 🔯 9	SGL □0	DEG [ANGLE:	: <u>45</u> °
X ₀ F	Ref. Point (Lo)	: Start	ed @ 1" b	elow	horiz. we	ıld							
Yol	Ref. Point (Wo	c): Cent	er line of	24"ris	er								
	Sizing Meth	od	Angle (d	eg)	Refere	ence Cal	. She	et		Set-U	p / File N	ame	
1	45 ⁰ SHEAR												
2													
	3 AATT												
4	DUAL 0°												
!		1 13/-12	T 75-44 T	1.5	INDICA			L2		182:445	14/0		
Ind.	Method	Weld Side	Depth R. Lig.	Max Amp		Leng (in		(in)	W1 (in)	Width (in)	W2 (in)	Indica	ation Type
									_			<u> </u>	
									ļ			<u> </u>	
							_						
												<u> </u>	
												 	
	A - 400/00/00/00/00/00/00/00/00/00/00/00/00/					_			_			<u> </u>	10.1.1.1.1
						_							
						4	_						
							_						
		<u> </u>			:							<u> </u>	
	narks:	a indian	donn										
'	lo crack lik	e indica	lions										
[N1] See Att	tachad I	etter Fro	m I F	R Elder								
	miner: W. H		Exam		J. LIGGI	_	Ana	lyst: V	V. H. Nelson	F	Reviewer:	J. B. El	der
4	HNe	b-	_				4	H	Del		[N1]		
Lev	el: <u>III</u> Date:	07/18/05	i	Dat	e:		Leve	el: <u>III</u> Date: <u>08/23/05</u> Level: <u>III</u> Date:					
1													

	AUTO	DMATED DAT	ULTRAS(TA REPO			Job # 04	-41	Riser # 26					
Loc	ation:			System:	Exa	n Start:		Exam End:					
200 EAST TANK FARM PSP-4							06/27/05 0916 2051						
	nponent ID:	104-AN				⊠	nination Surface		Nominal Thickness: 0.8750"				
	figuration:		ATE TO	PLATE		Ran		Temp: AMB ^O F					
	al Length Exar	nined: 20	.8"	Scan Width:	15"	·	Ref. Level Correction (Trans. Corr):						
Pro ·	cedure: CO	GEMA SVI	JT-INS-00	7.3	Rev. 2		erial Type: SS ⊠ CS OTI	HER:	Condition: N/A				
	Name m #:	VEF	RT.WALL/F	LATE 5			sducer: DUAL 🗵 SGL	0 DEC	B ⊠ ANGLE: 45°				
	Ref. Point (Lo)	Started (@ 1" below	horiz. wel	d				4.0				
Υol	Yo Ref. Point (Wo): Center line of 24"riser												
	Sizing Metho	od A	ingle (deg)	Refere	nce Cal. Sh	eet		Set-Up / F	ile Name				
1	45 ⁰ SHEAR												
2	60° SHEAR												
3	AATT	`											
4	DUAL 00							· · · · · · · · · · · · · · · · · · ·					
	INDICATION INFORMATION												
Ind.	Method		epth Max		Length	L2	1		W2 Indication Type				
	, , , , , , , , , , , , , , , , , , , ,	Side R	. Lig. Amp). (in)	(in)	(in)	(in)	(in) (in) Malcaton Type				
						<u> </u>							
	-												
					<u> </u>								
					_								
				<u> </u>									
Re	marks:						_!						
١	Remarks: No crack like indications [N1] See Attached Letter From J. B. Elder												
_		. Pigrdy	Examiner:	<u>. Lidoi</u>	Ar	nalvst: V	V. H. Nelson	Revi	ewer: J. B. Elder				
V	JDHU	rdy.				(H)	Debo	 1N1)					
Lev	el: <u>II</u> Date:	06/27/05	Da	te:	Le	vel: <u> </u>	Date: <u>08/23/0</u>)5Leve	el: <u>III</u> Date:				
Р	-Scan Limited	·	1										

AUTOM	ATED UL	Job# Riser# 26				,]				
	DAT	A REPORT							<u>' </u>	
	AST TANK	FARM						1430_		
Component ID:	104-AN		Examination Surface: Nominal Thickness: .50							
Configuration:	PLA:	TE TO			Cal Rar	ibrated nge: 0	.3" то 1.0"	1	Temp:	AMB [©] F
Total Length Exam	ined: 90.3	" Se	can Width:	17"	Ref	. Level Correct	ion (Trans. C	on.):		O DB
Procedure: CO(SEMA SVU	T-INS-007.	3	lev 2	Mat	terial Type: ISS ⊠ CS O'	 THER:		Cond	lition: N/A
File Name:	VERT.	WALL/2 ND /F	LATE1		Tra	nsducer:		3 Г	ANGLE	o
Xo Ref. Point (Lo):	1" above	bottom horiz	z. weld, sca	nned u	 o					
Yo Ref. Point (Wo):	17" from (center line o	f first pass							
Part # / Indication	X Start (in)	X Stop (in)	Y Start (in)	Y Sto		Ave. Thk. (in)	Min. Thk., R. Lig. (in)	1	rea ortable	Max. Thk. (in)
0-12						.530"	.504"			.535"
12-24						.530 ⁱ	.480"			.535"
24-36						.530"	.490"			.535"
36-48						.530"	.494"			.535"
48-60				<u> </u>		.530"	.502"	1		.535*
60-72						.530*	.504"			.535*
72-84				<u> </u>		.525"	.499"			.535"
84-90.3						.525" .498"				.535"
			<u> </u>							
	<u> </u>		<u> </u>	ļ				+		
		<u> </u>						-		<u></u>
								1		
Remarks:										
	•									
[NI41 O A4		- France 1. D								
[N1] See Atta Examiner: W. H.		r From J. B. Examiner:	cloet	Δης	lvst-	W. H. Nelson	Ray	iewer	J. B. E	lder
1 117/7	26				<u>//</u>	Dela	N.		J. D. E	
Level: III Date: _		Date		Lev	el: <u>11</u>	Date: <u>08/08</u>			Date:	
							ļ			

AUTOM	Job#								
-	DAT	A REPO	RT		04-41 26				
Location: 200 EA	AST TANK	FARM		E)	Exam Start: Exam End: 07/21/05 0743 Exam End: 13				
Component ID:	104-AN	, ,		E)	xamination Surfa ☑ OD ☐ ID	ce:	Nominal Thickness:	.500"	
Configuration:	PLA	TE TO				alibrated	.3" то 1.0"	Temp:	AMB ^o F
Total Length Exam	ined: 89.4	4"	Scan Width:	15"	R	ef. Level Correct	ion (Trans. Co	orr.):	0 DB
Procedure: COC	GEMA SVL	JT-INS-00	7.3	Rev 2		laterial Type: □ SS ⊠ CS O	THER:	Cond	iltion: N/A
File Name:	VERT	.WALL/2 ^{NI}	P/PLATE2			ransducer:	SL 🖾 O DEC	∃ ∏ ANGLE	0
Xo Ref. Point (Lo):	1" below	horiz. wel	d						
Yo Ref. Point (Wo):	17" from	center line	of first pa	ss					
Part # / Indication	X Start (in)	X Stop (in)		t Y	Stop (in)	Ave. Thk. (in)	Min. Thk., R. Lig. (in)	Area Reportable	Max. Thk. (in)
0-12		·				.525"	.499"		.535"
12-24						.525"	.502"		.535"
24-36						.525"	.501"		.535"
36-48						.525"	.503"		.535"
48-60						.530"	.503"		.535"
60-72						.530"	.507"		.535"
72-84						.525"	.501"		.535"
84-89.4						.525"	.503"		.535"
	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~								
								<u> </u>	<u></u>
					<del></del>				
				'					
Remarks:		<u>.</u>		ľ		<u> </u>			<u> </u>
								٠.	
[N1] See Atta	ched Lette	r From J.	B. Elder						
Examiner: W.D.I		Examiner:		7	Analyst	t: W. H. Nelson	Rev	iewer: J.B.E	lder
MDHr	Ady			s	W	Valek	<u>[N1</u>	1	·
Level: <u>II</u> Date: (	07/21/05	Da	ate:	_   1	Level: _	III Date: <u>08/09</u>	/05 Leve	el: <u>III</u> Date:	
P-Scan Limited									

AUTOM	AUTOMATED ULTRASONIC THICKNES DATA REPORT					Job# Riser# 26					
	DATA REPORT cation: 200 EAST TANK FARM						O	4-41 		26	·
Location:	ACT TABII			Ē	Exam Start:			E	xam End:		
	ANI I CP	FARM				07/20 Examination		0835	-   N	ominal	2016
	104-AN					⊠ OD [		PAINTED		hickness:	.500"
Configuration:	PLA	TE ^{TO}			F	Calibrated Range:		.3" то 1.0		1	AMB ^o F
Total Length Exam	ined: 89.6	S" S	Scan Width:	17"	F	Ref. Level C	orrect	ion (Trans.	Соп.	):	O DB
Procedure: CO	GEMA SVL	IT-INS-007	.3	Rev	2	Material Typ ☐ SS 🖾 (		THER:		Cond	ition: N/A
File Name:	VERT.	WALL/2 ND /	PLATE3	I <u></u> .		Transducer:				☐ ANGLE	
Xo Ref. Point (Lo):	1" below	horiz. weld									·
Yo Ref. Point (Wo)		center line	of first pas								
Part # / Indication	X Start (In)	X Stop (in)	Y Start		/ Stop (in)	Ave. 7		Min, Thk R. Lig. (ir		Area Reportable	Max. Thk. (in)
0-12				.515	5"	.494"			.530"		
12-24				.520	)*	.496"			.535"		
24-36				.525	5"	.499"			.535"		
36-48			.525" .490"							.535"	
48-60			.525" .500"						.535"		
60-72						.52	5"	.503"			.535"
72-84						.525	5"	.501"			.535"
84-89.6						.52	5"	.490"			.535"
		1	ļ								
			<u> </u>								
			<u> </u>	·							
								<u></u>			
Remarks:											
[N1] See Atta		····	. Elder								
Examiner: W. H. Nelson Examiner:						Analyst: W. H. Nelson Reviewer: J. B. Elder				lder	
WHILE					WHILM INTI						
Level: III Date: _	07/20/05	Date	e:	-	Level:	: <u>    </u> Date: _	08/08	<u>3/05</u> L	evel:	<u>III</u> Date:	

AUTOMA		RASONI A REPOR		NESS		Job#	4-41	Riser# 20	3
Location:	ST TANK	FARM			Exa	am Start:	000F	Exam End:	0040
Component ID:					Exa	07/20/05 amination Surfa		Nominal	2016
Configuration:	04-AN	TO				OD ID [		Thickness: Temp:	.750"
-	PLA	ΓE			Rai	nge: 0	.3" то 1.0"		AMB ^o F
Total Length Examine	^{ed:} 105.	9"	Scan Width:	17"	Rei	f. Level Correct	ion (Trans. C	orr.):	O DE
	EMA SVU	T-INS-007	.3	Rev 2		terial Type: ] SS   ⊠ CS   Oʻ	THER:	Conc	lition: N/A
File Name:	VERT.\	NALL/2 ND /	PLATE4			nsducer: ☑ DUAL □ S(	SL 🛛 0 DE	G □ ANGLE	. 0
Xo Ref. Point (Lo):	1" below h	oriz. weld			<u></u>	<u> </u>	2 2302	<u> </u>	··
Yo Ref. Point (Wo):	17" from 0	enter line	of first pas	ss					**************************************
Part # / Indication	X Start (in)	X Stop (in)	Y Start (in)	l l	itop n)	Ave. Thk. (in)	Min. Thk., R. Lig. (in)	Area Reportable	Max. Thk. (in)
0-12						.765"	.744"		.780"
12-24						.765"	.743"		.780"
24-36						.770"	.746"		.780"
36-48	·					.770"	.749"		.780"
48-60			!			.770"	.752"		.780"
60-72						.770"	.753"		.780"
72-84						.775"	.744"		.780"
84-96						.775*	.751"		.780"
96-105.9						.775"	.754"		.780"
						ļ			
Remarks:									
[N1] See Attach Examiner: W. H. Ne		From J. B Examiner:	. Elder	l Ar	alvet	W. H. Nelson	T 6	riewer: J. B. E	ldes
WAD Delso	ĺ	CABITATION.		2	UŁ	1 Delson			
Level: III Date: 07	/20/05	Date	e;	_ Le	vel: <u>[]]</u>	Date: <u>08/08</u>	/05 Lev	el: <u>III</u> Date: _	·····
COGEMA-SVUT-INS-007,3,	Rev. 2. Altachm	ent 6	<del></del>					On:	v. Dec. G3, 2003

AUTOM	AUTOMATED ULTRASONIC THICKNES DATA REPORT cation: 200 EAST TANK FARM						Job# O4	4-41	Ris	er# 26	5
Location: 200 E/	AST TANK	FARM			Ε	Exan	n Start: 06/27/05	1420	Exa	ım End:	2047
Component ID:	104-AN				E		nination Surfa	ce:		ninal ckness:	.875"
Configuration:	PLA	TE TO	***************************************				rated	.3" TO 1.0"			AMB ^O F
Total Length Exam	ined: 21.2	)n	Scan Width:	15"		Ref.	Level Correcti	ion (Trans. C	orr.):		0 DB
Procedure: COC	GEMA SVU	IT-INS-00	7.3	Rev 2			rial Type: SS ⊠ CS 01	THER:		Conc	ition: N/A
File Name:	VERT.	WALL/2 ^{NE}	PLATE 5			Tran	sducer:		G G	☐ ANGLE	
Xo Ref. Point (Lo):	1" below	horiz. wel	d			<del></del> ,					·
Yo Ref. Point (Wo):	17" from (	center line	of 1 st pass	s							
Part # / Indication	Y	Stop (in)		Ave. Thk. (in)	Min. Thk., R. Lig. (in)		Area portable	Max. Thk. (in)			
0-12 (in) (in) (in) (in) (in)							.890"	.857"			.905"
12-21.2							.885"	.858"			.905"
								·			
						_					
									<u> </u>		
									_		
					···						
		ļ									_
									ļ		
								•	ļ		··-
1212											
Remarks:											
	·										
	[N1] See Attached Letter From J. B. Elder							1			
Examiner: W.O.	Examiner: W. D. Purdy Examiner:				Analyst: W. H. Nelson Reviewer: J. B. Elder				lder		
WDAU	rant			—   ·		*	/ Jehn	-   IN	11		
Level: <u>II</u> Date: _	06/27/05	Da	ite:		Level:	: <u>[]]</u>	Date: <u>08/11</u>	<u>/05</u> Lev	/el: <u>  </u>	L Date:	
P-Scan Limited	I										İ

	AUTO		D ULTF DATA RI		NIC P-SC	CAN		Job# (	04-41	Riser	# 26	
Loca	ation:				System:		Exan	n Start:		Exam	End:	
	200 E/	AST TA	NK FARI	<i>I</i>		SP-4		07/19/05		. l		1433
-	nponent ID:	104-A	١					nination Sur DD □ ID	face: PAINTED	Nomi Thick		0.5000"
Con	figuration:		PLATE	TO ·	PLATE		Calib Rang	rated je:	D" TO 1.41	4"	Femp:	AMB ^O F
Tota	I Length Exar	nined:	90.2"		Scan Width:	17"	Ref.	Level Corre	ction (Trans.	Corr):	0_	DB
Pro	cedure:	GEMA :	SVUT-IN	S-007	.3	Rev. 2	Mate	rial Type:	OTHER:		Condi	tion: N/A
File / Ite	Name m #:	VE	RT.WAL	.L/2 ND /	PLATE1		Tran	sducer:		EG 🗵	ANGLE:	0
	Ref. Point (Lo)	Starte	ed @ 1" a	above	horiz. wel	d, scann		23.0		<u> </u>		
Y _o f	Ref. Point (Wo	<u> </u>		· · ·	of first pas	······································	·····	of secone	d pass			
	Sizing Metho	od	Angle (d	leg)	Referen	ce Cal. Si	neet	)	Set-Up	/ File Na	me	
1 45 ^o SHEAR												
2 60° SHEAR 3 AATT												
3												
4	DUAL 0 ⁰											
					INDICAT	ION INFO						
Ind.	Method	Weld Side	Depth R. Lig.	Max. Amp.		Length (in)	L2 (in)	W1 (in)	Width (in)	W2 (in)	Indica	tion Type
						<u> </u>						
										_ :		
			<u> </u>									
	marks:											
N	lo crack like	indicat	ions									
Ţſ	N1] See Att	ached L	etter Fro	m J. B	. Elder							
	miner: W.H.			niner:		Aı	nalyst: V	V. H. Nelson	Re	viewer:	J. B. E.d	er
1	VX)7(c	la-				_	VX)	X/el-	11	<u> </u>		
Lev	el: <u>III</u> Date: _	07/19/05		Date	e:	_ Le	vel: <u>III</u>	Date: <u>08/2</u>	3/05 Le	vel: <u>   </u>	Date:	

	AUT		ED ULTF DATA RI			SCAN			Job#	04-41		Riser	# 26	5	
Loc	ation:	^ T T A	NUZ EADA	,	System:	DCD /		Exar	n Start:			Exam	End:	4050	
Con	200 E	AST 17	NK FARM	VI		PSP-4	<u></u>	Exa	07/21/05 mination Sur		0	Nomir	nal	1356	
İ		104-A	N					Ø	OD 🗆 ID		ED	Thickr	ness:	0.5000"	
	figuration:		PLATE	то	PLATE			Ran	<b>3</b>	0" то 1.			emp:	AMB ^O F	
	al Length Exa	mined:	89.3"		Scan Width	1	5"	<u> </u>	Level Corre	ction (Tra	ans. C	orr):		DB	
Pro	cedure: CC	GEMA	SVUT-IN	S-007	<b>7.3</b>	Rev.	2		erial Type: SS ⊠ CS	OTHER: _			Conc	lition: N/A	
/ Ite	Name m #:		ERT.WAL	L/2 ND	/PLATE 2	2			isducer: DUAL 🗵	SGL □	0 DEC	<b>S</b>	ANGLE	<u>45</u> °	
	Ref. Point (Lo	Star	ted @ 1" t	oelow	horiz. we	eld									
Yol	Ref. Point (W	o): 17" 1	rom'cente	center line of first pass to center line of second pass  gle (deg) Reference Cal. Sheet Set-Up / File Name								,			
	Sizing Meth		Angle (d	leg)	Refere	ence Ca	l. She	et		Set-	Up / F	ile Nan	ne		
1	45° SHEAR												·		
2	60° SHEAR	<u> </u>			}					<del> </del>			<del></del>		
3	DUAL 0°				<u> </u>				<u> </u>						
4	DUAL 0				INDICA	TION	NEOF	7	1011	Set-Up / File Name  Width W2 Indication Type					
<b>-</b>		Weld	Depth	Max	<del></del>	INDICATION INFORMATION  L1 Length L2 W1 Width W2									
Ind.	Method	Side	R. Lig.	Amp			and a land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the land of the					ation Type			
							.			i Indication					
		ļ						<u>.</u>			<u> </u>				
			<u> </u>												
													-		
Rei	marks:														
V	lo crack lik	e indica	tions												
	V1] See Att		_etter Fro	m J, E	3. Elder										
Exa	miner: W D	. Purdy	Exan	iner:			Ana	lyst: V	V, H. Nelson		Revi	ewer: J	l. B. El	der	
77	717H	لبلهد	<del> -</del>	<del> </del>	·		W	41	lefor		[N1]				
Lev	el: <u>II</u> Date:	07/21/0	<u>}</u>	Dat	e:		Leve	el: <u>   </u>	Date: 08/2	3/05	Leve	l: <u>III</u> C	Date: _		
P	-Scan Limited	i								ļ					

<u>.</u>	AUTO		D ULTR ATA RE		ONIC P-S RT	CAN		Job#	04-41	Riser#	26	
Loc	ation:	^ CT TAN	UZ E A CIA	A	System:		Exar	m Start:		Exam End:		
Con	200 E/	ASIIAN	NK FARM	1	<u> </u>	PSP-4	Eva	07/20/05		Nominal	2019	
		104-AN					⊠ (	OD 🗌 ID	□ PAINTED	Thickness:		
	nfiguration:		PLATE		PLATE		Rang	<b>u</b>	0" то 1.414		AMB ^o F	
	al Length Exar	nined:	86.6"		Scan Width:	17"			ction (Trans.	·	<u>0</u> DB	
		GEMA S	SVUT-INS	S-007	<b>'</b> .3	Rev. 2			OTHER:		ndition: N/A	
	Name m #:	VE	RT.WALI	L/2 ND	/PLATE 3		. ,	nsducer:	SGL 0 DE	EG 🖾 ANG	LE: 45°	
	Ref. Point (L _o )	Starte	ed @ 1" b	elow	horiz. wel	ld						
Y _o I	Ref. Point (Wo	,): 17" fro	om cente	r line	of first pa	iss to ce	nter line	of secon	d pass			
	Sizing Metho		Angle (de	eg)	Refere	nce Cal. S	heet		Set-Up /	/ File Name		
1	45° SHEAR											
2	60° SHEAR	·			<u> </u>			<u> </u>		·		
3	AATT				<del> </del>							
4	DUAL 0°		<del></del>	<del></del>								
ļ	INDICATION INFO								Width	140		
Ind.	Method	Side	R. Lig.	Max Amp		Length (in)	1,2 (in)	W1 (in)	(in)	W2 (in) Ind	lication Type	
						1	1					
							1					
							1					
Rei	marks:					<del></del>	~1		<u></u>			
١	lo crack like	e indicati	ons									
[ n	N1] See Att	ached Le	etter From	m J. f	3 Flder							
	miner: W.H.		Exam		<u> </u>	A	Analyst: V	V. H. Nelson	Re	viewer: J.B.	Elder	
1/2	H) Me	In				/	12/1	nobe	_ [N·	11		
Lev	el: <u>III</u> Date:	07/20/05		Dat	:e:	   L	.evel: <u>   </u>	Date: <u>08/2</u>		vel: <u>III</u> Date:		

	AUTO	DMATEI D	ULTRATA RE			CAN			Job#	04-41	F		6
Loc	ation: 200 E/	AST TAN	K FARM		System:	PSP-4		Exar	π Start: 07/21/0	5 0819	i i	Exam End:	1400
Con	nponent ID:	104-AN							mination Su	rface:	1		0.7500"
Con	figuration:		LATE	ТО	PLATE				orated	0" TO 2.	Exam End:  19 140  Nominal Thickness: 0.75  2.12" Temp: AM  rans. Corr): 0 D  Condition: N/A  10 DEG ANGLE: 4		AMB ^o F
Tota	l Length Exa	mined:	05.8"		Scan Width	i: 17	nı		<b>-</b>			<u>l</u> rr):	
Pro	cedure:	GEMA S	·	-007	3	Rev.	2		erial Type:	OTHER:			dition:
	Name m #:		RT.WALL					Tran	sducer:		0 DFG		
	Ref. Point (L _o )	: Started	d @ 1" be	elow l	horiz. we	ld		1	DONE E		0020	23,000	<u></u>
Υ _ο Ι	Ref. Point (Wo	.)•					ente	er line	of seco	nd pass			
	Sizing Metho	od	Angle (de	g)	Refere	nce Cal	. She	et		Set-	Up / File	e Name	
1	1 45° SHEAR												
2	60 ⁰ SHEAR												
3	AATT												
4	DUAL 0°						NFORMATION						
		·										· · · · · · · · · · · · · · · · · · ·	
Ind.	Method	Weld Side	Depth R. Lig.	Max. Amp.		L1 Length L2 W1 Width W2 Inc					. 1 111111111	cation Type	
					<u>.</u>								
											<u> </u>		
					1								
	- 4·m···										·		
		1											,
Rei	marks:	!!								·····	L.		
	No crack like indications  [N1] See Attached Letter From J. B. Elder												
	miner: W. H.		Exami		·		Anal	yst: V	V. H. Nelso	n	Reviev	wer: J.B.E	lder
U	4) Mer		_		<u>.                                    </u>		Les	417	lessa		[N11		
Lev	el: III Date:	07/21/05	-	Date	):		Leve	al: <u>III</u>	Date: <u>08/</u>	23/05		<u>III</u> Date:	
L													

	AUTO		ULTRAS		CAN			)4-41	Rise	er# 26		
Loca	ation:	AST TANI	CEARM	System:	PSP-4	Exar	n Start: 06/27/05	1435	Exa	m End: 2053		
Con	ponent ID:	104-AN	(174 (14)	<u> </u>		Exar	nination Sur	face:	Non	ninal		
Con	figuration:		ТО				orated	PAINTED		Tempy		
			LATE	PLATE		Rang		0" то 2.5'		AMB OF		
	l Length Exar	ninea: 2	0.9"	Scan Width	15"			ction (Trans.	Corry:	<u>0</u> DB		
Proc	cedure:	GEMA S\	/UT-INS-00	7.3	Rev. 2		erial Type: SS 🖾 CS	OTHER:		Condition: N/A		
	Name m #:	VER	T.WALL/2 ^N	D/PLATE 5			sducer: DUAL 🔯 :	SGL 00	EG I	⊠ ANGLE: 45°		
	Ref. Point (Lo)	•	@ 1" belov									
Yo F	Ref. Point (Wo	·}·	n center lin			nter line	of second	d pass				
	Sizing Metho	· · · · · · · · · · · · · · · · · · ·	Angle (deg)	<u>-</u>				<del></del>	/ File N	ame		
Sizing Method Angle (deg) Reference Cal. Sheet Set-Up / File Name  1 45° SHEAR  2 60° SHEAR												
3	AATT											
4	DUAL 0°											
INDICATION INFORMAT												
Ind.	Method	Depth Ma R. Lig. Am	Length (in)	L2 (in)	W1 (in)	Width (in)	W2 (in)	Indication Type				
	·	Side		ıp. (in)		1						
		-							· · · · · · · · · · · · · · · · · · ·			
<b> </b>							<del> </del>					
<b>  </b>						-		<del> </del>				
						-		<u> </u>		<u> </u>		
				-				ļ				
						<del>-</del>						
·												
							-					
Rei	marks:	· · · · · · · · · · · · · · · · · · ·		· · ·			<del></del>			<del></del>		
N	lo crack like	e indicatio	ns									
l	·											
<b>_</b> _,	141 Occ 44	nobed Le	Har Eram I	D Eldos								
	N1] See Att	acned Le . Purdv	Examiner:		A	nalvst V	V. H. Nelson	l R.	viewer	: J. B. Elder		
$ \tilde{\mathcal{U}} $	~ / /	idi				(1)	Debo	<b>I</b>	V1)	. o. o. u.u.		
Lev	_evel: <u>11</u> Date: <u>06/27/05</u> Date:			.	.evel: <u>   </u>	Date: 08/2		,	Date:			
P	-Scan Limited									<del>-</del>		

AUTOM		RASONIC A REPORT	ESS		Job# O4	4-41	Rise	er # 26	3	
Location:	AST TANK	FARM			Exa	m Start: 07/12/05	1335	Exa	m End:	1942
Component ID:	104-AN					mination Surfa	ce:		ninal	
Configuration:	PLA	TE TO			Cal	XOD ☐ ID [ ibrated nge: 0.		Thic	kness: Temp:	.500" AMB ^o F
Total Length Exam			an Width:	17"	Ref	. Level Correcti		orr.):		0 DB
Procedure:		T-INS-007.3	Re			terial Type:	THER.		Cond	
File Name:		QUID / AIR			Tra	nsducer:		· —	ANGLE	0
Xo Ref. Point (Lo):	start at ea				<u>                                       </u>	200.00	2, 000.		74100	
Yo Ref. Point (Wo):	center line	of scanner	@ 30" belo	w top i	noriz	. weld				
Part # / Indication	X Start (in)	X Stop (in)	Y Start (in)	Y Sto (in)		Ave. Thk. (in)	Min. Thk., R. Lig. (in)		Area portable	Max. Thk. (in)
0-12		,			.530"	.501"			.535"	
12-24					.530"	.503"			.535"	
24-36					.530"	.498"			.535"	
36-37.28				.530" .511"						.535"
			!					-		
								_		
							<u> </u>	_		
								-		
						<u> </u>	· · · · · · · · · · · · · · · · · · ·	-		
			·					-		
Remarks:		ĺ					<u> </u>	<u></u>		
Remarks.										
IN11 See Atts	[N1] See Attached Letter From J. B. Elder									
Examiner: W. H.		Examiner:	Lidoi	Ana	ılyst:	W. H. Nelson	Rev	iewe	r: J. 8. E	lder
WHITE	m		transt-	WHI Refor [NI]						
Level: III Date: _	07/12/05	Date:		Lev	'el: <u>    </u>	Date: <u>08/08</u>	1/05 Lev	el: <u>II</u>	L Date:	

AUTOM		TRASONIC		ESS		Job#	4-41	Rise	r# 20	3
Location:					Exa	ım Start:		Exar	n End:	
	AST TANK	FARM				07/12/05	1335			1942
	104-AN					amination, Surfa 図 OD □ ID [	ice:		kness:	.500"
Configuration:	PLA	TE TO			Rar		.3" то 1.0	l"	Temp:	AMB ^o F
Total Length Exam	ined: 21.	7" S	can Width:	17"	Ref	. Level Correct	ion (Trans.	Corr.):		O DB
Procedure: CO	GEMA SVU	JT-INS-007.	3 F	lev 2	Ma	terial Type:  SS ⊠ CS O	THER:		Conc	lition: N/A
File Name:	L	IQUID / AIR	В		Tra	nsducer:		FG T		0
Xo Ref. Point (Lo):	liquid/air	B started at	end of A	· · · · · · · · · · · · · · · · · · ·	J <u>4</u>	3	<u> </u>			
Yo Ref. Point (Wo):		e of scanner		ow top l	noriz	weld		<u>.</u>		
Part # / Indication	X Start (in)	X Stop (in)	Y Sto	op qo	Ave. Thk. (in)	Min. Thk. R. Lig. (in		rea ortable	Max, Thk.	
0-12					.530"	.501"			.535"	
12-21.7							.505"			.535"
12-21.7 .530"										
				****						
		<u> </u>								
				<u> </u>						
	~1000 · ·									
Remarks:		<del></del>					· <del></del>			
	[N1] See Attached Letter From J. B. Elder									
1.11	Examiner: W. H. Nelson Examiner:					Analyst: W. H. Nelson Reviewer: J. B. Elder				lder
WELLE	<u> </u>	V		-   4	WELLEN NI					<del></del>
Level: <u>III</u> Date: _	07/12/05	Date:		Lev	el: <u>III</u>	_ Date: <u>_08/08</u>	<u>//05</u> Le	vel: <u>III</u>	Date: _	
				}			-			

AUTOM	ATED ULT	TRASON A REPOI		NESS		Job#	4-41	Riser	# 20	3
Location: 200 F	AST TANK	FARM			Ex	am Start: 07/14/05	0956	Exam	End:	2224
Component ID:	104-AN	7 7 4 474			Ex	amination Surfa	ce:	Nomi Thick		.500"
Configuration:	PLA	TE TO				librated	.3" TO 1.0	1 7		AMB ^O F
Total Length Exam			Scan Width:	17"		f. Level Correct				0 DB
Procedure:	GEMA SVU		7 3	Rev 2	Ma	iterial Type:	ruco.		Cond	lition:
File Name:					Tra	SS CS CS				N/A
Xo Ref. Point (Lo):		QUID / A				⊠ DUAL □ SC	3L ⊠0D	EG L	) ANGLE	
Yo Ref. Point (Wo)			at end of B		- <b>-</b>				····································	
	Center line	X Stop	ner @ 30" t		Stop	z. weid Ave. Thk.	Min. Thk.	.   A	rea	Max. Thk.
Part # / Indication	(in)	(in)		in)	(in)	R. Lig. (in		ortable	(in)	
0-12						.535"	.508	<u> </u>		.540*
12-24						.535*	.510"			.540"
12-24     .535"     .510"       24-36     .535"     .503"       36-48     .535"     .511"									.540"	
36-48				.535" .511" .5						.540"
48-60										.540"
60-72						.535*	.511"			.540*
72-84						.535"	.513"			.540"
84-96						.535"	.504"			.540"
96-108						.535*	.514"			.540"
108-120						.535"	.505"			.540"
									, .,	
					7000					
			- I							
Remarks:	<del></del>	. <del></del>	<del></del>							<del></del>
1					-					
[N1] See Atta	ched Lette	r From J.	B. Elder							
Examiner: W. H.		Examiner:		Į P	nalyst	W. H. Nelson	R	eviewer.	J. B. E	lder
WHILE	6			\ 6	124	Ilelm	1	<u> 111</u>		·
Level: Ill Date: _	07/14/05	Da	ite:	_   \	.evel: <u>1</u>	II Date: <u>08/09</u>	9 <u>/05</u> Le	evel: <u>111</u>	Date:	

AUTOM		TRASONIC		ESS		Job#	4-41	Ris	er# 26	3		
Location:	<i></i>	21	•		Fx=	m Start:		Fys	ım End:			
200 EA	AST TANK	FARM				07/14/05				2224		
Component ID:	104-AN					mination Surfa ⊠ OD ☐ ID [			ninal ckness:	.500"		
Configuration:	PLA	TE TO			Cali Rar	ibrated nge: 0.	.3" то 1.0		Temp:	AMB ⁰ F		
Total Length Exam	ined: 70.2	2" S	can Width:	17"	Ref	. Level Carrecti	ion (Trans.	Corr.):		0 DB		
Procedure: COC	SEMA SVL	IT-INS-007.	3 F	Rev 2		terial Type: ISS ⊠ CS O	THER:		Cond	ition: N/A		
File Name:	L	IQUID / AIR			Tra	nsducer:		neg	☐ ANGLE	0		
Xo Ref. Point (Lo):		D started at			· · ·				,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
Yo Ref. Point (Wo):				ow top	horiz	. weld	······································					
Part # / Indication         X Start (in)         X Stop (in)         Y Start (in)         Y Stop (in)         Ave. Thk. (in)         Min. Thk., R. Lig. (in)         Area Reportable         Max. Thk. (in)           0-12         535"         503"         545"												
Part #7 Indication (in) (in) (in) (in) (in) R. Lig. (in) Reportable (in)  0-12 .535" .503" .545  12-24 .535" .509" .545  24-36 .535" .506" .545  36-48 .535" .504" .545									.545"			
Part # / Indication         X Start (in)         X Stop (in)         Y Start (in)         Y Stop (in)         Ave. Thk. (in)         Min. Thk., R. Lig. (in)         Area Reportable         Max. T (in)           0-12         .535"         .503"         .545           12-24         .535"         .509"         .545           24-36         .535"         .506"         .545           36-48         .535"         .504"         .545           48-60         .535"         .500"         .545									.545"			
24-36	.535" .509" .5 .535" .506" .5 .535" .504" .5									.545"		
36-48			<u> </u>		.535" .504" .545"							
48-60						.535"						
60-70.2						.535"	.504"			.54-5"		
				ļ								
				ļ								
			ļ									
				ļ								
						<u> </u>						
Remarks:  [N1] See Atta	[N1] See Attached Letter From J. B. Elder											
Examiner: W. H.	Examiner: W. H. Nelson Examiner:						Analyst: W. H. Nelson Reviewer: J. B. Elder					
WH Wel	·>~			_   4	Ut.	Lefon	_	[N1]		<del></del>		
Level: <u>III</u> Date: _	07/14/05	Date		Lev	/el: <u>  </u>	Date: <u>08/09</u>	9 <u>/05</u> L	.evel: <u>l</u> i	II Date:			

AUTOM		TRASONIC		IESS		Job#	4-41	Rise	r# 26	3
	.ocation: Exam Start: Exam End: 07/13/05 0735 1442 Component ID: 104 AN Examination Surface: Nominal									
200 E	AST TANK	FARM				07/13/05		Exar	n End:	1442
Component ID:	104-AN					⊠ ci 🖂 do 🖾			inal kness:	.500"
Configuration:	PLA	TE TO P	LATE			ibrated nge: 0	.3" то 1.0	"	Temp:	AMB ^o F
Total Length Exam	ined: 88.4	4" S	can Width:	11.3"	Ref	. Level Correct	ion (Trans. (	Сопт.):		0 DB
Procedure: CO	GEMA SVL	JT-INS-007.	3	Rev 2		terial Type: SS 🖾 CS O	THER:		Cond	lition: N/A
File Name:	VER	T.WELD/PL	ATE2		Tra	nsducer:		= =G [	 ☐ ANGLE	0
Xo Ref. Point (Lo):		horiz. weld			1	<u> </u>	<u> </u>			
Yo Ref. Point (Wo):	•	e of vert. w	eld							
Part # / Indication	X Start (in)	X Stop (in)	Y Start (in)	Y Sto	,	Ave. Thk. (in)	Min. Thk., R. Lig. (in)		\rea ortable	Max. Thk. (in)
0-12						.520"	.478*			.530"
12-24 .520° .482° .530°										
24-36 .520" .481"										.530"
36-48						.520"	.487"			.530*
48-60						.520"	.488"			.530"
60-72						.520"	.482"			.530"
72-84	-					.520"	.478"			.53.0"
84-88.4						.520"	.482"			.530"
			<u> </u>							
		ļ		_						
		ļ								
<u></u>				_						
D		<u> </u>								
Remarks:										
[N1] See Δtts	[N1] See Attached Letter From J. B. Elder									
Examiner W. D.		Examiner:	Lidei	Ana	llyst:	W. H. Nelson	Re	viewer	: J. B. E	lder
MDHgr	dy			_ /1	41	Dilon	<u> </u>	J1]		
Level: <u>II</u> Date: _	07/13/05	Date		L.ev	el: <u>[]]</u>	Date: 08/15	5/05 Le	vel: <u>   </u>	Date:	
P-Scan Limited										

AUTOM	ATED UL	TRASON A REPO		NESS		Job # ()4	4-41	Riser#	6		
Location: 200 E/	AST TANK	FARM			E	xam Start: 07/19/05	0725	Exam End:	1441		
Component ID:	104-AN				E	xamination Surfa	ce:	Nominal Thickness:	.500"		
Configuration:	PLA	TE TO	PLATE	<del></del>	1	alibrated	.3" TO 1.0"	Tomo:	AMB ^o F		
Total Length Exam			Scan Width:	11.44	10	ef. Level Correcti			o DB		
Procedure:	GEMA SVL		7.3	Rev 2	M	aterial Type: ☐ SS ☑ CS 01	rueo.	Con	dition:		
File Name:		T.WELD/F			Tr	ransducer:			N/A °		
Xo Ref. Point (Lo):		horiz. wel				⊠ DUAL □ SG	L 🛛 0 DE	G □ ANGL	<u>E:</u>		
Yo Ref. Point (Wo)						· · · · · · · · · · · · · · · · · · ·			<u></u>		
center line of vert. weld  Part # / Indication											
0-12 .520° .485" .535°											
12-24 .520" .482" .535"											
24-36 .520" .480" .535"											
24-36											
48-60						.520"	.487"		.535"		
60-72			<b>-</b>			.520"	.485"		.535"		
72-84						.520*	.463"		.535"		
84-89.5						.520"	.486"		.535"		
Remarks:											
[N1] See Atta	[N1] See Attached Letter From J. B. Elder										
Examiner: W.D.		Examiner:			Analyst	: W. H. Nelson	Re	viewer: J.B.	Elder		
MDM	Whiteless IN1										
Level: 11 Date: _	07/19/95	Da	te:		Level: _	III Date: <u>08/16</u>	<u>/05</u> Lev	/el: III Date:			
P-Scan Limited											

AUTOM	ATED UL	TRASON	IIC THICK	NESS		Jop #		Riser#			
		A REPO					4-41	20	3		
Location:	A OT TANK				E	xam Start:		Exam End:			
200 E/ Component ID:	AST TANK	FARM			-	07/19/05 xamination Surface		Nominal	1441		
	104-AN	<b>1</b>	·					Thickness:	.750"		
Configuration:	PLA	TE TO	PLATE		R	a, 154.00	.3" то 1.0"		AMB ⁰ F		
Total Length Exam	ined: 102	.8"	Scan Width:	11.58"	- I	ef. Level Correcti	ion (Trans. C	orr.):	O DE		
Procedure: CO	GEMA SVL	JT-INS-00	7.3	Rev 2	M	laterial Type: ☐ SS   CS OT	THER:	Cond	lition: N/A		
File Name:	VER	T.WELD/	PLATE4	L	Tr	ransducer:		G □ ANGLE	0		
X _o Ref. Point (L _o ):		·	<del></del>			<u> </u>	<u> </u>		<u></u>		
Yo Ref. Point (Wo)			<del></del>								
Part # / Indication X Start X Stop Y Start Y Stop Ave. Thk. Min. Thk., Area Max. Thk. (in) (in) (in) (in) R. Lig. (ln) Reportable (In)											
0-12						.760*	.708"		.775"		
12-24						.755"	.733"		.7'70"		
24-36						.755"	.731"		.770"		
36-48						.750"	.735″		.7'70"		
48-60						.755"	.731"		.7'70"		
60-72						.755"	.729"		.770"		
72-84						.755"	.730*	<u> </u>	.770"		
84-96						.755"	.731"		.775"		
96-102.8					•	.760"	.738"		.775"		
									<u> </u>		
	<u></u>										
									ļ		
									<u> </u>		
	<u> </u>		<u> </u>						<u> </u>		
Remarks:											
[N1] See Atta						+. 1A/     A!-!-	1 =				
Examiner: W.O.	1	Examiner:			naiyst L/L	t: W. H. Nelson		viewer: J.B.	ider		
	rem					· /		1[	<u></u>		
Level: II Date: _	07/19/05	D	ate:	-   6	evel: _	III Date: <u>08/15</u>	5/05   Lev	rel: III Date:			
P-Scan Limited				1			1				

AUTOM		TRASONI A REPOR		NESS	,	O- Job#	4-41	Ris	er# 26	6	
Location:	AST TANK	EARM			Ex	am Start:	072E	Exa	ım End:	1112	
Component ID:	104-AN	LAISIVI			Ex	07/13/05 amination Surfa	ice:		ninal	1442	
Configuration:		TO	DI A 775		Ca	⊠ OD □ ID [ ilibrated			ckness: Temp:	.875"	
Total Length Exam	PLA		PLATE Scan Width:		Ra	inge: U if. Level Correct	.3" TO 1.1 ion (Trans.			AMB ^O F	
Procedure:	21.	3"		11.1" Rev		aterial Type:				O DB	
CO	GEMA SVU	JT-INS-007	.3	2	] [	]ss ⊠cs o	THER:		Conc	N/A	
File Name:		T.WELD/PI	ATE 5			ansducer: ☑ DUAL ☐ SO	GL 🛛 0 I	DEG	☐ ANGLE		
Xo Ref. Point (Lo):	1" below	horiz. weld									
Yo Ref. Point (Wo)	·	e of vert. v									
Part # / Indication	X Start (in)	X Stop (in)	Y Start (in)		Stop (in)	Ave. Thk. (in)	Min. Thi R. Lig. (i		Area portable	Max. Thk. (in)	
0-12 .900" .867" .915"										.915*	
12-21.3						.900"	.859"			.915*	
		ļ									
					·						
		1	<u> </u>	<u> </u>							
		<del>                                     </del>					<u> </u>			<u> </u>	
		<del> </del>									
		<del> </del>									
Remarks:											
[N1] See Atta	[N1] See Attached Letter From J. B. Elder										
Examiner: (W, D.		Examiner:		A	nalyst:	W. H. Nelson	F	Reviewe	r: J.B.E	Elder	
MDH	WD Hudy WHILESON INTI										
Level: II Date: _	07/13/0	Dat	e:	_  լ	.evel: <u>l</u>	II Date: <u>08/16</u>	<u>6/05</u> L	.evel: <u>I</u>	II Date:		
P-Scan Limited											

	AUTOMATED ULTRASONIC P-SCAN DATA REPORT  System:   Evam Start   Evam End										
Loca	Cation:   System:   Exam Start:   Exam End:										
	200 E	AST TANK	(FARM		PSP-4	ļ	07/13/05		<u></u>	1452	
		104- <b>AN</b>				<b> </b>			Thick	(ness: 0.5000"	
	figuration:		ATE TO	PLATE		Ran		0" то 2"		Temp: AME ^O F	
Tota	I Length Exar	mined: 80	3"	Scan Width	[:] 10.5"	Ref.	Level Correc	ction (Trans.	Сопт):	<u>0</u> DE	
Pro	cedure: CO	GEMA S\	/UT-INS-00	7.3	Rev. 2		eriai Type: SS ⊠ CS (	OTHER:		Condition: N/A	
	Name m #:	VE	RT.WELD/F	PLATE 2			sducer:	GL □ 0 DE	= ∃G ∑	☑ ANGLE: <u>60</u> °	
	Ref. Point (Lo)	: 1" belo	w horiz. wel	d							
Y _o F	Ref. Point (Wo	): Center	line of weld				<del> </del>	· · · · · · · · · · · · · · · · · · ·			
	Sizing Method Angle (deg) Reference Cal. Sheet Set-Up / File Name										
1	1 45° SHEAR										
	1 45° SHEAR										
	2 60° SHEAR 3 AATT										
4	DUAL 0°			<del> </del>							
				INDICA	TION INFO	RMAT	ION				
11	BA e 41 e e 4	Weld	Depth Ma		Length	<u> 2</u>	W1	Width	W2	1-11-41- Ti	
Ind.	Method	Side	R. Lig. Am	p. (in)	(in)	(in)	(in)	(in)	(in)	Indication Type	
				i							
								<del> </del>			
								<u> </u>			
								<u> </u>			
				1							
Re	marks:							<del>'</del>		<u> </u>	
N	lo crack like	e indicatio	ns								
ļ ,	[N1] See Attached Letter From J. B. Elder										
	miner: WND		Examiner:	D. Lidei	i An	alvet V	V. H. Nelson	Re	viewer.	J. B. Elder	
	JDH	udil			\	47	Delon		1]		
Lev	el: <u>II</u> Date:	7	Da	nte:	Lev	rel: <u>   </u>	Date: 08/2			Date:	
P	-Scan Limited										

	AUTO		D ULTR			CAN		Job#	04	-41	Rise	r# 2	6
Loca					System:		Exa	m Start:			Exan	n End:	
		AST TA	NK FARN	1		PSP-4		07/19		0746			1448
	ponent ID:	104-A	N				×			: PAINTED		kness:	0.5000"
	figuration:		PLATE		PLATE		Ran			" то 2"		Temp:	AMB ^o f
	l Length Exar	nined: 	87"		Scan Width	11.1	<u>'                                     </u>			7 (Trans.	Com):		O DB
		GEMA	SVUT-INS	S-007.	3	Rev. 2		eria! Type SS ⊠C		ER:		Con	dition: N/A
/ Ite			/ERT.WE	LD/PL	ATE 3			isducer:   DUAL	⊠ SGL		EG [2	ANGL	≘: <u>60</u> °
	tef. Point (L _o )	1" be	low horiz	. weld									
Y _o F	Ref. Point (Wo	): Cent	er line of	weld									
	Sizing Metho		Angle (d	eg)	Refere	nce Cal. S	Sheet			Set-Up	/ File Na	ame	
1	45° SHEAR												
2	60° SHEAR		····		.,	-							
3	AATT							ļ					
4	DUAL 0°				(NIDIOA)	TION IN	**************************************	301					
		Weld	Do-45	Mana	INDICA L1	TION INF		ION W	4 1	<b>Vidth</b>	1865		
Ind.	Method	Side	Depth R. Lig.	Max. Amp.		Length (in)	(in)	(ir	t t	(in)	W2 (in)	Indic	ation Type
					ļ <u>-</u>								
		· · · · · · · · · · · · · · · · · · ·				_	-						
	,				<u> </u>							<u> </u>	
					_							<u> </u>	
					ļ							ļ. <u>-</u>	
<u> </u>			<u> </u>										
						ļ							
												<u> </u>	,
<b>.</b>	narks:	_ 111 _	£!										
^	lo crack like	e indica	tions										
l p	[N1] See Attached Letter From J. B. Elder												
Exa	miner: (W. D	. Purdy	Ехап	niner:		1	Analyst:			R	viewer:	J. B. E	lder
<u> </u>	DH	LUDA	_				(4)	Ckl	201	п	11]		
Lev	Level: <u>II</u> Date: <u>07/19/05</u> Date: Level: <u>III</u> Date: <u>08/21/05</u> Level: <u>III</u> Date:												
Р	-Scan Limited												
COG	EMA-SVUT-INS-0	07.3 Rev 2	Attachment 5									Res	. Dec. 03, 2003

Att. 2-32

	AUTO		ULTRAS TA REPO		CAN		Job#	04-41	Riser # 26		
Loca	ation:	ACT TANK	/ E / E / B / A	System:	PSP-4	Exa	m Start:		Exam End:		
Con	200 E.	AST TANK	CFARIVI		P3P-4	Exa	07/19/05 mination Sur		1448 Nominal		
	•	104-AN					OD 🔲 DO	☐ PAINTED	Thickness: 0.7500"		
	figuration:		ATE TO	PLATE		Ran		0" то 3.0"	Temp: AMB ^O F		
Tota	l Length Exa	mined: 10	02.6"	Scan Width	^{1:} 10.8	3"		ction (Trans. (	<u>0</u> DB		
Prod	cedure: CC	GEMA S\	/UT-INS-00	17.3	Rev. 2		erial Type: SS ⊠ CS	OTHER:	Condition: N/A		
	Name m #:	VE	RT.WELD/	PLATE 4	·		nsducer:	SGL □ 0 DE	G ⊠ ANGLE: <u>6()</u> °		
	Ref. Point (Lo)	: Started	@ 1"below	/ horiz.wel	d						
Y _o f	Ref. Point (Wo	<u>.):</u>	line of weld					· - ,			
	Sizing Meth		Angle (deg)		ence Cal.	Sheet		Set-Up /	File Name		
1	1 45 ⁰ SHEAR										
2	2 60° SHEAR										
3	3 AATT										
4	DUAL 0°				·		<u> </u>				
<b></b>		Weld	Danib Ma	*******		FORMAT	TON W1	VACCALL.	14IO		
Ind.	Method		Depth Ma R. Lig. An		Lengti (in)	h L2 (in)	(In)	Width (in)	W2 (in) Indication Type		
					1						
			· [								
$oxed{oxed}$											
	marks:										
N	lo crack lik	e indicatio	ns								
			ter From J.		ı	Applicate 1	À/ L/ Niele		deuren 1 D Ett-		
⊏xa	miner: W.D	) 1	Examiner:			Milalyst \	W. H. Nelson	1	riewer: J. B. Elder		
~	WD Rudy WHILLIAM IN11										
Lev	el: <u>11</u> Date:	07/19/03	. D	ate:		Level: III	Date: <u>08/2</u>	2 <u>2/05</u> Lev	rel: III Date:		
P	-Scan Limited	i									

	AUTO		D ULTRA	SONIC P-S	CAN		Job#	04-41	Riser	26		
Loc	ation: 200 EA	AST TAN	NK FARM	System:	PSP-4	Exar	n Start; 07/13/05	5 0750	Exan	n End: 1452		
Cor	nponent ID:	104-AN					nination Sur		Nomi			
Cor	figuration:		PLATE TO	PLATE			orated	0" то 3.5'		Temp: AMB ^o F		
Tota	al Length Exar	nined:	18.9"	Scan Width	10.8"			ction (Trans.		<u>()</u> DB		
Pro	cedure;		SVUT-INS-0	007.3	Rev.		erial Type: SS 🖾 CS	OTHER,		Conciltion:		
	Name m #:		ERT.WELD			Tran	sducer:	SGL 00		ANGLE: 60°		
	Ref. Point (Lo)	:		w horiz.wel	d		DOME ZY	001 00		ANGLE, <u>00</u>		
Yo	Ref. Point (Wo	):	er line of we					, , , , , , , , , , , , , , , , , , ,				
	Sizing Method Angle (deg) Reference Cal. Sheet Set-Up / File Name  1 45° SHEAR											
<u> </u>	The state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the s											
	2 60 ^o SHEAR 3 AATT											
4	DUAL 00											
4	DUAL 0			1110101	TION INTO		1011					
	·	Weld	Depth N	INDICA Max, L1	TION INFO	L2	W1	Width	W2			
Ind.	Method	Side		mp. (in)	(in)	(in)	(in)	(in)	(in)	Indication Type		
						,						
			<u> </u>									
					<del>  -</del>							
					-			<del> </del>				
				_								
<u> </u>				<del></del>				<del>  -</del>				
<u> </u>		 						<del>  </del> -				
<u> </u>								<u> </u>				
		L										
Re	marks:											
١	lo crack like	e indicati	ions									
١,	[N1] See Attached Letter From J. B. Elder											
	miner:\ W_D		Examine		Ans	ilvst: V	V. H. Nelson	Re	viewer:	J. B. Elder		
[,	174	,, l	. 4			<i>W</i> )	V) a	1.				
17	J KLL C	y	Щ	~	<i>L</i>	<i>y</i> 7 <u>V</u>	1 8100	~   <u>1</u>	[1]			
Lev	el: <u>Il</u> Date:	07/13/ds	_}	Date:	Lev	el: <u>III</u>	Date: <u>08/2</u>	2 <u>2/05</u> Le	vel: <u>III</u>	Date:		
F	-Scan Limited	i										

	AUTO		ULTRAS	SONIC P-S ORT	CAN		Job#	04-41	Rise	r# 26	
Loca	cation:         System:         Exam Start:         Exam End:           200 EAST TANK FARM         PSP-4         07/20/05 0906         2015           Imponent ID:         104-AN         Examination Surface:         Nominal           FX on First Start:         0.5000"										
0		AST TAN	( FARM	1	PSP-4	 					
		104-AN								kness: 0.5000"	
Con	figuration:	PI	"ATE ^{TO}	PLATE		Cali Ran	brated ge:	0" то 1.41	4"	Temp: AME OF	
Tota	I Length Exar	nined: 4:	5.1"	Scan Width	5.6"	Ref.	Level Corre	ction (Trans	. Corr):	O DE	
Proc	cedure:	GEMA S	/UT-INS-0	07.3	Rev. 2		erial Type: SS 🖾 CS	OTHER:		Condition: N/A	
File / Ite	Name		·	ND/PLATE 2		Tran	sducer;	SGL 0	DEC 5	⊠ ANGLE: <u>45</u> °	
	tef. Point (L _o )	•		w horiz.weld			DOAL A	3GL [] (	DEG E	MANUEL TO	
Yof	Ref. Point (Wo	):	line of we								
<del> </del>	Sizing Method Angle (deg) Reference Cal. Sheet Set-Up / File Name										
1	1 45 ⁰ SHEAR										
2	2 60 ⁰ SHEAR										
3											
4	DUAL 0°										
				INDICA'	TION INFO	RMAT	TION				
Ind.	Method	Weld Side	and the second second	flax. L1 mp. (in)	Length (in)	L2 (in)	W1 (in)	Width (in)	W2 (in)	Indication Type	
						<del></del>					
			<del></del>		<del> </del>			1	<del></del> ,		
					1						
<u> </u>						·					
				<del></del>			<u> </u>	†			
Re	 marks:				<u> </u>						
١	No crack like indications [N1] See Attached Letter From J. B. Elder										
	miner: W. D		Examine		An	alvst: '	W. H. Nelsor	ı Tr	leviewer:	J. B. Elder	
וֹצו	Hau	Libr			_	(/[.]	Nelso		N1]		
Lev	evel:    Date: 07/20/95   Date: Level:    Date: 08/23/05   Level:    Date:										
1	-Scan Limited										

Rev. Dec. (13, 2003

	AUTO		D ULTR		NIC P-S	CAN			Job#	)4-41	Riser	# 20	6
Loca	ation:				System:			Ехаг	n Start:		Exam	End:	
		AST TAN	VK FARN	1		PSP-4			07/20/05		ļ.,		2015
	ponent ID:	104-AN	1					⊠ (		ace: PAINTED	Nomin Thick	ness:	0.5000"
	figuration:		PLATE		PLATE			Rang	<del>, </del>	)" то 1.414	*	Temp:	AMB ⁰ F
	al Length Exar	nined:	45"		Scan Width	5.6	3"			ction (Trans.	Con):	<del></del>	O DE
Proc	cedure: CO	GEMA S	SVUT-IN	S-007	.3	Rev.	2		erial Type: SS 🖾 CS (	OTHER:		Cond	dition: N/A
File / Ites	Name m #:	VEF	RT.WELD	/2 ND /F	PLATE 2	Ą			sducer: DUAL 🔯 8	SGL 0 D	EG ⊠	ANGLI	E: 45°
X ₀ F	Ref. Point (L _o )	Starte	ed @ 1"b	eiow h	oriz.wel	i		•					
Y _o F	Yo Ref. Point (Wo): Center line of weld												
	Sizing Method Angle (deg) Reference Cal. Sheet Set-Up / File Name												
1	1 45° SHEAR												
2													
3													
4	DUAL 00												
			<del></del>		INDICA	TION IN	<b>IFOF</b>	RMAT	ION	······································			
Ind.	Method	Weld	Depth	Max.		Leng		L2	W1	Width	W2	Indic	cation Type
	·	Side	R. Lig.	Amp.	(in)	(in)	<del>' -</del>	(in)	(in)	(in)	(in)		
$\vdash$							$\dashv$						
							$\dashv$						
							$\dashv$						
	·						$\dashv$						
						<b>-</b>			<u> </u>				
						-				<del> </del>	····		
	marks:								[	<u> </u>	. ,		
N	No crack like indications  [N1] See Attached Letter From J. B. Elder												
Exa	miner: (V. P	. Purdy	Ехап					lyst: V	V. H. Nelson	· ·	viewer:	J. B. E	lder
2	<u> </u>	man	<b>├-</b>				W	14	Yebo		1]		
Lev	el: <u>II</u> Date:	07/20/05	<u>ກ</u>	Date	e;		Leve	el: <u>III</u>	Date: <u>08/2</u>	3/05 Le	vel: <u>III</u>	Date:	
P	-Scan Limited	i											

•	AUTO		O ULTRAS ATA REPO		CAN		Job#	)4-41	Rise	er# 26	
Loc	ation:	AT TAN	K FARM	System:	PSP-4	Exar	n Start:	0006	Exa	m End:	
Con	nponent ID:			<u> </u>	F-4		07/20/05 nination Surf	ace:		2015 ninal 2 7 2 2 2 7	
Con	figuration:	104-AN	To				DD DID [	PAINTED	Thic	tkness: 0.5000"	
			PLATE	PLATE		Rang	ge: (	)" то 1.414		AME OF	
Tota	al Length Exan	nined: {	37"	Scan Width	n: 5.5"	Ref.	Level Correc	ction (Trans. (	Corr);	<u>0</u> DB	
Pro	cedure: CO	GEMA S	VUT-INS-00	7.3	Rev. 2		erial Type: SS ⊠ CS (	OTHER:		Condition: N/A	
	Name		RT.WELD/2 ^N		l	Tran	sducer:			0	
	m #: Ref. Point (L _o ):					<u> _</u>	DUAL S	GL 0 DE	:6		
Yol	Ref. Point (Wo		d @ 1"below	noriz.wei	<u>a</u>				<del></del>		
.,	Center line of weld										
	Sizing Method Angle (deg) Reference Cal. Sheet Set-Up / File Name  1 45° SHEAR										
	1 45° SHEAR 2 60° SHEAR										
4	DUAL 0°		<del> </del>	<del>                                     </del>							
┝Ť	DOALO			INDICA	TION INFO	DRMΔT	ION	·			
<u> </u>		Weld	Depth Ma		Length	L2	W ₁	Width	W2		
Ind.	Method	Side	R. Lig. Arr		(in)	(in)	(in)	(in)	(in)	Indication Type	
						<u> </u>					
						<u>.</u>					
Re	marks:			<u> </u>	, l	<u> </u>	<del></del>	\			
١	lo crack like	e indicati	ons								
١,	[N1] See Attached Letter From J. B. Elder										
	Examiner: W.Q. Purdy Examiner: Analyst: W. H. Nelson Reviewer: J. B. Elder										
1	WDtandy With Melson INTI										
		07/00/00	2				-			F2-4-	
ļ	/el: <u>  </u> Date:		_   D	ate:	Le	evei: <u>III</u>	Date: <u>08/2</u>	<u>3/05</u>   Lev	/ei: <u>III</u>	_ Date:	
Į F	-Scan Limited	•	1		i			1			

## RPP-RPT-26254, Rev. 0

AUTOMATED U DATA	LTRASON A REPOR		CAN		Job#	4-41	Riser # 26			
Location:		System:		Exar	n Start:		Exam End:			
200 EAST TANK F	ARM	P	SP-4	<u> </u>	07/20/05		2015			
Component ID: 104-AN				⊠ (	nination Surfa		Nominal Thickness: 0.7500"			
Configuration: PLA		PLATE		Ran	<b>3</b> 4.	О" то 2.12"	1			
Total Length Examined: 103	.9" S	ican Width:	5.5"		Level Correc	tion (Trans. (	<u>0</u> DE			
Procedure: COGEMA SVU	T-INS-007.	3	Rev. 2		erial Type: SS ⊠ CS C	THER:	Condition: N/A			
, (1001) 11.	VELD/2 ND /F	PLATE 4			sducer: DUAL ⊠S	GL 🗆 0 DE	G ⊠ ANGLE: 45°			
	1"below h	oriz.weld								
Yo Ref. Point (Wo): Center line of weld										
Sizing Method Angle (deg) Reference Cai. Sheet Set-Up / File Name										
Sizing Method Angle (deg) Reference Cai. Sheet Set-Up / File Name  1 45° SHEAR  2 60° SHEAR										
3 AATT										
4 DUAL 0°	<u> </u>									
•		INDICAT	ION INFO	RMAT	ION					
	pth Max. Lig. Amp.	(in)	Length (in)	L2 (in)	W1 (in)	Width (in)	W2 (in) Indication Type			
		-								
		ļ								
				·						
		<u> </u>								
		<del>                                     </del>	1							
Remarks:		L			<u> </u>	<u> </u>				
No crack like indications										
[N1] See Attached Letter Examiner: W.D. Purdy	r From J. B. Examiner:	. Eluer	ΙΔο	1/8+· 1	V. H. Nelson	I Ray	riewer: J. B. Elder			
White W. Fundy	LARINIEI.		_   2	() <u>{</u> )	Defor	I				
Level: <u>Il</u> Date: <u>07/20/09</u>	Date	:	Lev	el: <u>III</u>	Date: <u>08/23</u>		el: III Date:			
P-Scan Limited										

COGEMA-SVUT-INS-007.3, Rev. 2, Attachment 5

	AUTOMATED ULTRASONIC P-SCAN DATA REPORT ocation: System:								Job# C	4-41	F	Riser# 26	
Loca							Exa		Start:		E	Exam End:	
		AST TAI	VK FARN	<u> </u>	F	PSP-4			06/30/05	0925			1305
	ponent ID:	104-AN	1					0	ination Surf				0.87:50"
	figuration:		PLATE		PLATE		Ra	ıngı		0" то 2.			AMB ^o F
	I Length Exa	mined:	21.4"		Scan Width	5.5"			evel Correc	tion (Tran	ns. Cor	0	DB
Proc	edure: CC	GEMA S	SVUT-IN	S-007	.3	Rev. 2			ial Type: S ⊠ CS C	THER:		Condit	ion: N/A
File / Ite	Name m #:	VE	RT.WELI	סא2 ^{וסא}	PLATE 5			Transducer: ☐ DUAL ☑ SGL ☐ 0 DEG ☑ ANGLE: 45°					
X _o F	Ref. Point (L _o )	: Starte	ed @ 1"b	elow l	noriz.weld	1							
Yo Ref. Point (Wo): Center line of weld													
Sizing Method Angle (deg) Reference Cal. Sheet Set-Up / File Name													
1	45° SHEAR												
2	60° SHEAR							4					
3	AATT							_					
4	DUAL 0°												
									<del>-   </del>				
Ind.	nd. Method Weld Depth Max. L1 Ler Side R. Lig. Amp. (in) (i								(in)	Width (in)	W: (In	I Indica	tion Type
										! 	-		
		ļ <del></del>				-	_				-		
						<del> </del>					<u> </u>		
											<u> </u>		
							-				-		<del></del>
Re	narks:						····			L	.1	<del></del>	
١	lo crack lik	e indicat	ions										
-	V1] See At				3. Elder	ŗ	Annh	141	LI NISISS	<del></del>	Davide	10 51	
/ / Fxa	miner: W. D	L A L	Exan	ııner:			Analyst: W. H. Nelson Reviewer: J. B. Elder  [N1]				er		
Lev	el: Il Date:	06/30/05		Dat	e:	· · · · · · · · · · · · · · · · · · ·	Level: III Date: 08/23/05 Level: III Date:						
	-Scan Limited												

AUTOM	ATED UL	TRASON	NC THICK	NESS		Job#		Riser#	1		
, , , , , , , , , , , , , , , , , , ,		A REPO			04-41 26						
Location:	10T TANK	EADM.			Exa	ım Start:		Exam End:			
200 EA	AST TANK	FARM			 	07/18/05 mination Surfa		Nominal	1935		
	104-AN				<u>l</u> 1			Thickness:	.875"		
Configuration:	PLA	TE TO	KNUCKLE		Rar	190.	.3" то 1.0"	Temp:	AMB ^o F		
Total Length Exam	ined: 64.8	3"	Scan Width:	10.5"	Ref	. Level Correct	ion (Trans. Co	orr.):	0 DB		
Procedure: COC	GEMA SVL	JT-INS-00	7.3	Rev 2	Material Type: Condition:  □ SS ☑ CS OTHER: N/A						
File Name:	HORIZ	Z.WELD/K	KNUCKLE		nsducer:	SL 🖾 0 DEC	3 □ ANGLI	. 0			
Xo Ref. Point (Lo):			ld attachme			<u>E3</u> 7 3 1					
Yo Ref. Point (Wo): Center line of weld											
Part # / Indication											
0-12	-					.900"	.867"		.915"		
12-24				j		.900"	.868"		.915"		
24-36						.900"	.873"		.915°		
36-48						.900"	,874"		.915"		
48-60						.900"	.871"		.915"		
60-64.8		ļ				.900"	.871"		.915"		
		ļ									
						,					
		1						-			
		<u> </u>									
	····	ļ									
							·				
Remarks:	l										
Plate side on	ıy										
[N1] See Atta			B. Elder								
Examiner: W.D. I	Purdy \	Examiner:		Ana	Analyst: W. H. Nelson Reviewer: J. B. Elder				lder		
MDA	urdy			6	Whilelam [N1]						
Level: <u>II</u> Date: <u>I</u>	07/18/05	Da	ate:	_ Lev	el: <u>III</u>	Date: <u>08/17</u>	/05 Lev	el: <u>III</u> Date:			
P-Scan Limited											

AUTOM	ATED ULT	<b>TRASONI</b>	C THICK	NESS	Job# Riser#					
		A REPOR				4-41		26	3	
Location:					Exa	m Start:		Exa	m End:	
	AST TANK	FARM				07/18/05				1935
	104-AN				1 [	mination Surfa ☑ OD 📋 ID [			ninal :kness:	.875"
Configuration:	PLA ⁻	TE TO	KNUCKLE	:	Ran	w.	.3" то 1.0'		Temp:	AMB ^o F
Total Length Exam	ined: 96.6	)" [ ⁵	Scan Width:	10.4"	l	Level Correct	ion (Trans. C	Corr.):		0 DB
Procedure: COC	GEMA SVU	T-INS-007	.3	Rev 2		erial Type: SS ⊠ CS 01	THER:	_	Cond	lition: N/A
File Name:	HORIZ.	WELD/KNI	UCKLE A		Trai	nsducer:				,
X _o Ref. Point (L _o ): Started at end of horiz.weld/knuckle										
Yo Ref. Point (Wo):	Center lin		• • • • • • •							
Part # / Indication	X Start (in)	X Stop (in)	Y Start (in)	Y Si		Ave. Thk. (in)	Min. Thk., R. Lig. (in)		Area portable	Max. Thk. (in)
0-12						.900*	.868"			.915"
12-24						.900*	.869"			.91.5*
24-36						.895"	.859"			.910"
36 <del>-4</del> 8						.890"	.863"		:	.910"
48-60						.890"	.862"	<u> </u>		.910"
60-72		<u> </u>				.890"	,862"			.910"
72-84			<del>-  </del>			.890"	.861"	1.		.910"
84-96						.890"	.861*			.910"
96-96.6					<u></u>	.890"	.876*			.910"
								_		
· · · · · · · · · · · · · · · · · · ·			_							
								+		
		<del>                                      </del>						<u></u>		
Remarks:		<u> </u>				<u> </u>	<u> </u>			
Plate side on	lv									
	-,									
[N1] See Atta	sahad Latta	r Erom I E	Eldor							
Examiner W. D.	). Eluei	ΙΔE	alvet	W H Nelson.	T De	viewe	r: J. B. E	lder		
WHA	المأرا	Examiner:			analyst: W. H. Nelson Reviewer  W. H. Nelson [N1]			. <b>.</b>	.1001	
Level: II Date: _	07/18/05	Dat	e:					<del></del>		
	07710700	Jac	G.	-   25	Level: III Date: 08/17/05 Level: III Date: _					
P-Scan Limited				.			,			

AUTOM.	ATED ULT	RASONIC	THICKN	IESS							
	DATA	A REPORT	Γ		04-41 26				3		
Location:	ACT TANK	EADM			Exa	m Start:	0000	Exa	m End:		
Component ID:	AST TANK	FARIVI			Fva	07/18/05 mination Surfa		Norr	inal	1935	
	104-AN					<b>⊠</b> 00 [⊠			kness:	.875"	
Configuration:	PLA	TE TO K	NUCKLE		Ran		.3" то 1.0"		Temp:	AMB ^o F	
Total Length Exam	ined: 92.6	3" S	can Width:	9.5"	Ref.	Level Correct	ion (Trans. Co	orr.):		n DB	
Procedure:	SEMA SVIII	T-INS-007.3	3	Rev 2		erial Type:	ruco.		Cond		
File Name:					Transducer:						
Xo Ref. Point (Lo):		WELD/KNU			DUAL SGL ⊠ 0 DEG ANGLE:						
		est of the w	eld attachr	nent, we	st of	the 24" rise	r				
Y _o Ref. Point (W _o ): Center line of weld											
Part # / Indication         X Start (in)         X Stop (in)         Y Start (in)         Y Stop (in)         Ave. Thk. (in)         Min. Thk., (in)         Area Reportable (in)           0-12         .890"         .861"         .905"											
0-12	,					.890"	.861*			.905"	
12-24						.885"	.852"			.905"	
24-36						.910"	.878"			,920"	
36-48						.910"	.884"			.920"	
48-60						.910"	.887"			.920"	
60-72						.910"	.876"			.920"	
72-84						.910"	.881*			.920"	
84-92.63						.910"	.877"	<u> </u>		.915"	
								_			
			<u> </u>					_			
								ļ			
			ļ					<u> </u>			
		<u> </u>	******					ـــــــ			
								<u> </u>			
						]					
`Remarks:				•							
Plate side on	ly										
[N1] See Atta		r From J. B.	Elder					······			
Examiner: W.D.	Analyst: W. H. Nelson Reviewer: J. B. Elder				lder						
marc	Mar		_ W/ LK/2   IN11								
Level. II Date: _	07/18/09	Date	·	Level: <u>III</u> Date: <u>08/17/05</u> Level: <u>III</u> Date:							
P-Scan Limited											

AUTOM		TRASONIC A REPORT		SS		Job#	4-41	Riser#	26		
Location:	<i></i>	,,,, <u>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>			Fya	m Start:	=	Exam End:			
200 EA	AST TANK	FARM				07/18/05	0828		1940		
<u> </u>	104-AN					mination Surfa ☑ OD ☐ ID [		Nominal Thickness:	.875"		
Configuration:	PLA	TE ^{TO} K	NUCKLE			brated ige: 0	.3" то 1.0'	Temp	AMB ^o F		
Total Length Exam	ined: 64.8	3" S	can Width: 1	0.5"	Ref.	. Level Correct	on (Trans. C	Corr.):	() DB		
Procedure: COC	SEMA SVL	JT-INS-007.3	Re	v 2	Material Type: Condition: Condition: N/A						
File Name:	HORIZ	Z.WELD/KN	UCKLE		Trai	nsducer:	-	= G □ ANG	0		
Xo Ref. Point (Lo):		est of weld		west o			<u> </u>				
Yo Ref. Point (Wo):			· · · · · · · · · · · · · · · · · · ·					·			
Center line of weld											
0-12						.925"	.898"		.935"		
12-24						.925"	.901"		.935"		
24-36						.925"	.903"		.935"		
36-48						.925"	.889°		.935"		
48-60	·					.925"	.920"		.935"		
60-64.8						NO DATA	NO DATA		NO DATA		
									<u> </u>		
							***************************************				
									:		
							4	<u> </u>			
	-										
Remarks:			<u>                                     </u>			<u> </u>			1		
Knuckle side	only, no da	ata at 60-64.	8 due to sur	face ro	uahr	ness		•			
,					-5						
[N1] See Atta	[N1] See Attached Letter From J. B. Elder										
Examiner: W.D.		Examiner:		Analyst: W. H. Nelson Reviewer: J. B. Elde			Elder				
MDH	udu			1 1 Telan INII							
Level: <u>II</u> Date: <u>(</u>	07/18/05	Date:		Leve	el: <u>III</u>	Date: <u>08/17</u>		/el: <u>   </u> Date			
P-Scan Limited											

AUTOM	ATED ULT DATA		Job # Riser # 26					6			
Location: 200 FA	AST TANK	FARM			E	Exa	m Start: 07/18/05	0828	E	am End:	1940
Component ID:	104-AN	- ,		• • • • • • • • • • • • • • • • • • • •	E		mination Surfa	ce:		ominal	.875"
Configuration:	PLA	TE TO	KNUCKLE	<u> </u>			on DiD [	<u>.1 סז "3.</u>		ickness: Temp:	AMB ^o F
Total Length Exam		- <del></del>	Scan Width:				Level Correct				o DB
Procedure:	GEMA SVU		· ·	Rev		Material Type: Condition:					lition:
File Name:			SS 🖾 CS O				N/A o				
HORIZ.WELD/KNUCKLE A							DUAL SC	3L ⊠00	EG	☐ ANGLE	
Started at end of horiz.weld/knuckle Yo Ref. Point (Wo):											·····
Center line of weld											
Part # / Indication	X Start (in)	X Stop (in)	Y Start (in)	t Y	Stop (in)		Ave. Thk. (in)	Min, Thk R. Lig. (Ir		Area eportable	Max. Thk. (in)
0-12			·				.930"	.906*			.945"
12-24							.930"	.902"			.945"
24-36							.930"	.895"			.945"
36-48							.930"	.893*	ŀ		.945"
48-60							.930"	.890			.940"
60-72							.925"	.882"			.940"
72-84							.930"	.895"			.940"
84-96						.925" .880"			.940"		
96-96.6							.925*	.896*			.940"
										·	
									_		
Demontos		<u> </u>									
Remarks: Knuckle side	only										
Tuibolus olds	Omy.										
IN11 See Atte	schad Lette										
[N1] See Attached Letter From J. B. Elder Examiner: W. D. Purdy Examiner:						st:	W. H. Nelson	R	eview	er: J.B.E	Ider
					WHI Deform INII						
Level: <u>II</u> Date: _	07/18/05	Dat	e:		Level:     Date: 08/17/05   Level:     Date:						
P-Scan Limited										<u> </u>	

AUTOMA	AUTOMATED ULTRASONIC THICKNESS							Riser#	_		
		A REPO		*		0.	4-41	26	3		
Location: 200 E/	AST TANK	FARM			Exa	am Start: 07/18/05	0828	Exam End:	1940		
Component ID:	104-AN					mination Surfa	ce:	Nominal Thickness:	.875"		
Configuration:	PLA	TE TO	KNUCKLE	<u> </u>	Cal	ibrated	.3" то 1.0"	Temp:	AMB ^O F		
Total Length Exam	ined: 92.6	33"	Scan Width:	9.5"		f. Level Correct	lon (Trans. Co	orr.):	O DB		
Procedure:	GEMA SVL	JT-INS-00	7.3	Rev 2	Ma	Material Type: Condition:  ☐ SS ☑ CS OTHER: N/A					
File Name:	· · · · · · · · · · · · · · · · · · ·		NUCKLE B	Tra	nsducer:		- I ANGLE	0			
Xo Ref. Point (Lo):				DUAL □ SGL ☑ 0 DEG □ ANGLE:  t, west of 24" riser							
Yo Ref. Point (Wo):			<u>., 17 G.</u>	3(0) 24 1130	4						
Part # / Indication X Start X Stop Y Start (in) (in) (In) Ave. Thk. Min. Thk., Area Max. Thk. (in) R. Lig. (in) Reportable (in)											
0-12						.925"	.892"		.940"		
12-24						.955"	.922"		.960"		
24-36						.950*	.913*		.960"		
36-48						.950"	.916"		.960"		
48-60						.950"	.910"		.960"		
60-72						.940"	.907"		.960"		
72-84		<u> </u>				.945"	.917"		.960*		
84-92.63						.925*	.913"		.940*		
		<del> </del>			<u>.</u>	<u> </u>					
						<u> </u>		<u> </u>			
		-			<del></del> -			-	<u> </u>		
				<u> </u>							
		<u> </u>									
Remarks:	<u> </u>	1				.1	<u> </u>	<u> </u>	<u> </u>		
Knuckle side	only										
[N1] See Atta	ached Lette	r From J.	B. Elder								
Examiner W. D.	Purdy	Examiner:		Ai	nalyst:	W. H. Nelson	Rev	rlewer: J.B.	Elder		
MARM	4	<del> </del>		&	WHILESON IN11				· · · · · · · · · · · · · · · · · · ·		
Level: <u>II</u> Date: _	07/18/05	D	ate:	_ L	vel: <u>  </u>	1 Date: <u>08/17</u>	<u>7/05</u> Lev	el: III Date:			
P-Scan Limited											

Att. 2-45

Rev. Dec. 03, 2003

COGEMA-SVUT-INS-007.3, Rev. 2, Attachment 6

	AUTO	MATED	ULTRASC	NIC P-S		Job#		Riser	#		
	7.014		A REPOR		· · · · · · · · · · · · · · · · · · ·		(	04-41	26		
Loc	ation:			System:		Exa	m Ştart:		Exam	End:	
		AST TANK	FARM		PSP-4	1	07/18/05			1945	
	nponent ID:	104-AN					mination Surf		Nomi Thick	nai ness: 0.8750"	
	figuration:		ATE TO	KNUCKL	E	Calil Ran	orated ge:	0" то 3.5"	' '	Temp: AMB ^O F	
Tota	il Length Exar	nined: 62	.2"	Scan Width	10.5"	Ref.	Level Correc	tion (Trans.	Corr):	<u>()</u> DB	
Рто	cedure:				Rev.	Mate	erial Type:			Condition:	
	CO	GEMA SVI	JT-INS-007	'.3	2		SS ⊠CS (	OTHER:		N/A	
/ Ite	Name m #:		Z.WELD/K	NUCKLE			BUAL X	SGL 🗌 0 D	EG 🗵	ANGLE: <u>60</u> °	
X₀i	Ref. Point (L _o )	West of	weld attach	ment, we	st of the (	east air	rline				
Yol	Ref. Point (Wo	): Center li	ne of weld								
Sizing Method Angle (deg) Reference Cal. Sheet Set-Up / File Name											
1	45° SHEAR										
2	60° SHEAR										
3	AATT										
4	DUAL 0°										
				INDICA	TION INFO	DRMAT	ION	•			
ind.	Method		epth Max		Length (in)	1_2 (in)	W1 (in)	Width (in)	W2 (in)	Indication Type	
<del> </del>		Side 1	. Lig. Aship	. (01)	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	(#1)	(81)	(111)	(11)		
				<u></u>		ļ					
			ļ			ļ		1 1			
				-							
					1						
									·		
Rei	marks:	·		·····		<u> </u>			······································	***************************************	
		e indication	s								
			er From J. E	3. Elder							
l. • • \						nalyst: V	V. H. Nelson	Re	viewer:	J. B. Elder	
$ \nabla$	WD Mudy										
Lev	el: <u>  </u> Date:	07/18/05	Dat	e:	Le	vel: <u>III</u>	Date: <u>08/2</u>	<u>1/05</u> Le	vel: <u>   </u>	Date:	
P	-Scan Limited	*	]								

DATA REPORT         04-41         26           Location:         System:         Exam Start:         Exam End:           200 EAST TANK FARM         PSP-4         07/18/05 0840         1945           Component ID:         Examination Surface:         Nominal Thickness:         0.8750"										
200 EAST TANK FARM         PSP-4         07/18/05         0840         1945           Component ID:         Examination Surface:         Nominal										
Component ID: Examination Surface: Nominal										
Configuration: PLATE KNUCKLE Calibrated Range: 0" TO 3.5" Temp: AMB OF										
Total Length Examined: 94.24" Scan Width: 10.5" Ref. Level Correction (Trans. Corr): 0 DB										
Procedure: Rev. Material Type: Condition:  COGEMA SVUT-INS-007.3 2 ☐ SS ☒ CS OTHER: N/A										
File Name / Item #: HORIZ.WELD/KNUCKLE A  Transducer: □ DUAL ☑ SGL □ 0 DEG ☑ ANGLE: 600°										
X _o Ref. Point (L _o ): Started @ end of horiz. weld/ knuckle										
Yo Ref. Point (Wo): Center line of weld										
Sizing Method Angle (deg) Reference Cal. Sheet Set-Up / File Name										
1 45° SHEAR										
2 60° SHEAR										
3 AATT										
4 DUAL 0°										
INDICATION INFORMATION										
Ind Method Weld Depth Max. L1 Length L2 W1 Width W2 Indication Turn										
Ind. Method Side R. Lig. Amp. (in) (in) (in) (in) (in) (in) (in)										
Remarks:										
No crack like indications										
[N1] See Attached Letter From J. B. Elder										
Examiner: W.Q. Purdy Examiner: Analyst: W. H. Nelson Reviewer: J. B. Elder										
WD Herdy WHI Deform INII										
Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:   Level:    Date:										
P-Scan Limited										

	AUTO	MATE	D ULTR	RASO	NIC P-S	CAN		Job#		Rise		
			ATA RE						04-41		20	5
Loca					System:		Exa	m Start:		Exa	m End:	
-		AST TAI	NK FARN	Λ	F	PSP-4	-	07/18/05				1945
	ponent ID:	104-A	N .					mination Sur OD   ID			ninal ckness:	0.8750"
	iguration:		PLATE		KNUCKLI		Ran		0" то 3.5		Temp:	AMB ^o F
Tota	l Length Exar	nined:	90.2"	,	Scan Width:	10.8	"	Level Corre	ction (Trans	s. Corr):	_(	DEI
Proc	edure: CO	GEMA S	SVUT-IN	S-007.	.3	Rev. 2		erial Type: SS 🛛 CS	OTHER:		Cond	fition: N/A
File / Iter	Name n #:	НО	RIZ.WEL	.D/KNI	UCKLE B			nsducer:	SGL □0	DEG	M ANGLE	<u>: 60</u> °
X₀F	Ref. Point (Lo)	: Starte	ed @ we	st of w	eld attach	nment w	est of 2	4"riser,at	end of ho	riz. we	ld/knuc	
Yo F	Yo Ref. Point (Wo): Center line of weld											
	Sizing Method Angle (deg) Reference Cal. Sheet Set-Up / File Name											
1 45° SHEAR												
2 60° SHEAR												
3	AATT											
4	DUAL 0 ⁰				***			101				
		Weld	Depth	Max.	INDICAT	Length		W1	Width	W2	<del></del>	·
Ind.	Method	Side	R. Lig.	Amp.		(ju)	(in)	(in)	(in)	(in)	Indic	ation Type
												<del>*************************************</del>
					<del>                                     </del>					·		
			<u> </u>		1	1			†			
			<del> </del>		<del>-</del>							
		<u> </u>						-			+	
							+					
Rer	narks:	L	<u>.                                    </u>						<u> </u>			
•	lo crack like	e indicat	ions									
	[N1] See Attached Letter From J. B. Elder  Examinet: W. D. Purdy Examiner: Analyst: W. H. Nelson Reviewer: J. B. Elder											
Exa	ininer: VV. D	. Puray	Exan	mner:		'	א אוואאד. <i>ו</i> אוו, <i>א</i>	v. m. meison	į.		. J. B. E	iuer
$ \pi $	MITT	ront	=   —				WH	l leson	<u> </u>	N1]	- ·, · · · · · · · · · · · · · · · · · ·	
Lev	evel: <u>II</u> Date: <u>07/18/05</u> Date: Level: <u>III</u> Date: <u>08/21/05</u> Level: <u>III</u> Date:											
P.	-Scan Limited											
COG	EMA-SVUT-INS-0	07.3, Rev. 2,	Attachment 5						<u>-</u>		Rev	Dec. 03, 2003

Att. 2-48

	AUTO		ULTRASC TA REPOI		CAN		,	Job# C	4-41	Riser#	26
Loc	ation:			System:		Ex		Start:		Exam E	
		AST TANK	FARM	<u> </u>	PSP-4			07/20/05			2015
	nponent ID:	104-AN					0	ination Surfa			ss: 0.8750"
_	figuration:		ATE TO	KNUCKL		Ra	ng		0" то 2.5		np: AMB ^o F
Tota	al Length Exar	nined: 12	0"	Scan Width	i: 5.5'	<u> </u>		evel Correc	tion (Trans	. Corr):	<u>0</u> DB
Pro	cedure: CO	GEMA SV	UT-INS-007	7.3	Rev. 2			ial Type: S⊠CS C	THER;		Condition: N/A
	Name m #:	HORIZ	.WELD/2 ND	/KNUCKL	E			ducer: DUAL 🛛 S	GL 0	DEG 🖾 A	NGLE: 45°
	Ref. Point (Lo)	: Started	@ weld atta	achment w	vest of e	east air	lin	e			
Υ₀Ι	Ref. Point (Wo	): Center li	ine of weld								
	Sizing Metho	od A	Angle (deg)	Refere	ence Cal.	Sheet		<del></del>	Set-Up	/ File Name	<del></del>
1	45° SHEAR						7		· · · · · · · · · · · · · · · · · · ·		
2	60° SHEAR										
3	AATT						7				
4	DUAL 0°		· · · · · · · · · · · · · · · · · · ·				7				
F			——————————————————————————————————————	INDICA	TION IN	FORMA	TI	ON		<del></del>	
Ind.	Method		Pepth Max		h La		W1	Width	W2	Indication Type	
		Side F	l. Lig. Amp	). (in)	(in)	(in	)	(in)	(in)	(in)	
<u> </u>			<del></del>	<del></del>		<del>-  </del>				<del></del>	
	-,,,,,,					_					
			<u>_</u>								
					1						
											_
Re	marks:			\					' <u> </u>		· · · · · · · · · · · · · · · · · · ·
ĺ١	lo crack like	e indication	s								
,	N(47 C) = - A44		<b></b> 1	D EIJ							
	[N1] See Attached Letter From J. B. Elder  xaminer: W. D. Purgy   Examiner: Analyst: W. H. Nelson   Reviewer: J. B. Elder										
1	WD Hardy WD Relson [N1]										
Lev	et: <u>Il</u> Date:	7/20/05	Da	te:		Level: III Date: 08/23/05   Level: III Date:				ıte:	
F	-Scan Limited	i	1							=	

	AUTO		D ULTRA	SONIC P-S ORT	CAN		Job#	26		
Loc	ation:			System:	**********	Fxa	m Start:		Exam 8	-nd-
	200 E	AST TAP	NK FARM		PSP-4		07/20/05			2015
	nponent ID:	104-AN						face:	Nomina Thickne	ess: 0.8750"
Con	figuration:	1	PLATE TO	KNUCKL	.E	Ran		0" TO 2.5"	ł	amp: AMB ^o F
Tota	al Length Exar	nined:	38.3"	Scan Width	n: 5.5"	Ref	Level Corre	ction (Trans.	Corr):	<u>0</u> DB
Pro	cedure:	GEMA S	SVUT-INS-0	007.3	Rev. 2		erial Type: SS 🖾 CS	OTHER:		Condition: N/A
	Name m #:			D/KNUCKLE	L	Trai	nsducer:		L	ANGLE: 45°
	Ref. Point (L _o )	:		arted @ end		1	DUAL M	3GL [] (1D)	<u> D.</u>	NGCE. 40
Yo	Ref. Point (Wo	):			OIGO 100		, ,.	· · · · · · · · · · · · · · · · · · ·		
Center line of weld  Sizing Method Angle (deg) Reference Cal. Sheet Set-Up / File Name										
1	45° SHEAR		Angle (deg)	Refere	ence Car.			Jet-Op /	FILE INGILI	-
2	60° SHEAR									
3	AATT									
. 4	DUAL 00							· -· · · · · · · · · · · · · · · · · ·		
				INDICA	TION IN	FORMAT	ION			
Ind.	Method	Weld Side		Max. L.1	Lengti (in)	h L2 (in)	W1 (in)	Width (in)	W2 (in)	Indication Type
		3106	The Litys   F	411Pr (111)	(11)	(117)	("')	(11:7)	(111)	
			ļ		<del> </del>			<del>                                     </del>		
								<del> </del>		
							<del> </del>			
-						-		-		
<u> </u>										
					-		-			
		<u> </u>						<del>    -</del>		
								<b> </b>		
$\vdash$					<del>                                     </del>	_		-		
<u> </u>				L				<u> </u>		
}	marks: Io crack like	e indicat	ions							
ľ	[N1] See Attached Letter From J. B. Elder									
	miner W. D		Examine		T	Analyst: 1	W. H. Nelson	Re	viewer: J.	. B. Elder
WDRudy WHOLESON INTI								11		
Lev	el: 11 Date:	7/20/03	_	Date:		Level: III	Date: <u>08/2</u>	3/05 Le	vel: <u>   </u> D	ate:
ı	-Scan Limited			<del></del>				_		

	AUTO		ULTRAS	SONIC P-S ORT	CAN		Job # . (	04-41	Riser#	26
Loc	ation: 200 E/	AST TAN	K FARM	System:	PSP-4	Exar	n Start: 07/20/05	0906	Exam End	1: 2015
Con	ponent ID:	104-AN					nination Sur		Nominal Thickness	
Con	figuration:	F	PLATE TO	KNUCKI	,E	Calit Rang	orated ge:	0" то 2.5"	Tem	p: AMB ^O F
Tota	I Length Exar	nined;	 38"	Scan Widti	1: 5.5"	Ref.	Level Corre	ction (Trans.	Corr):	<u>0</u> DB
Pro	cedure:	GEMA S	VUT-INS-0	07.3	Rev. 2		rial Type: SS ⊠ CS	OTHER:	C	ondition: N/A
	Name m #:	HORIZ	Z.WELD/2 ^{NI}	KNUCKLE	В		sducer: DUAL 🔯 8	GGL □ 0 DE	EG 🖾 ANG	GLE: 45°
1	Ref. Point (Lo)	File k	nuckle B st	arted @ en	d of knuc	kle A file	9			
Yo	Ref. Point (Wo	): Cente	r line of wel	d						
	Sizing Metho	od	Angle (deg)	Refere	ence Cal. S	heet		Set-Up /	File Name	
1	45 ⁰ SHEAR									
2	60° SHEAR									
2 60° SHEAR  3 AATT  4 DUAL 0°										
				INDICA	TION INF	ORMAT				
Ind.	Method	Weld Side	• 1	mp. (in)	Length (in)	L2 (in)	(in)	Width (in)	W2 (in)	dication Type
-								-		
					_					
_										
-										
-										
<u> </u>										
1	Remarks: No crack like indications  [N1] See Attached Letter From J. B. Elder									
	Examinet: W. D. Purdy Examiner: Analyst: W. H. Nelson Reviewer: J. B. Elder									
7	WDRudy WDRudy IN1)									
1	Level: <u>II</u> Date: Level: <u>III</u> Date: Level: <u>III</u> Date:									
LF	-Scan Limited	1								

AUTOM		TRASONIO A REPOR		NESS		1	4-41	Riser#	26	3
Location: 200 E/	AST TANK	FARM			Exa	am Start: 07/25/05	0924	Exam	End:	2040
Component ID:	104-AN					amination Surfa	ce:	Nomin: Thickn		.875"
Configuration:	KNUCK	LE TO	•		Cai	librated	.3" то 1.0	Te		AMB °F
Total Length Exam	ined: 120	" S	can Width:	9.8"		f. Level Correcti	ion (Trans.	Corr.):		n DB
Procedure:	GEMA SVL	JT-INS-007.	3	Rev 2		iterial Type: ]SS ⊠ CS 01	rued,		Cond	lition:
File Name:		KNUCKLE		<u> </u>	Tra	ansducer:		- 1		N/A
Xo Ref. Point (Lo):	Started at		1 2	⊠DUAL □ SG	SL 🖾 OD	EG []	ANGLE			
Yo Ref. Point (Wo)		horiz. weld								
Part # / Indication	X Start (in)	X Stop (in)	Y Start (in)		top	Ave. Thk. (in)	Min. Thk. R. Lig. (in	7 1		Max. Thk. (in)
0-12						.950*	.917"			.975"
12-24	.945"	.902"			.970"					
24-36 .945" .909"										.975*
36-48						.955"	.919"			.975"
48-60				.955*	.912"			.975"		
60-72						.955*	.920"			.975"
72-84				.950"	.910"			.970"		
84-96					.940 .903"					.970"
96-108						.940"	.906*			.970"
108-120						.940*	.900"			.970"
										<u></u>
						<u>'</u>				
Remarks:	abod Latta	s Esom I D	Eldor							
[N1] See Atta Examiner( W. D.		Examiner:	. Liuei	A	nalyst:	W. H. Nelson	R	eviewer: .	i. B. E	lder
MARW	- 10 - 1			4	14	Defor	- 1	N1]		
7						evel: <u>11</u> 1 [	Date: _			
P-Scan Limited										

AUTOM		TRASONIC A REPORT		NESS		Job#	4-41	Riser#	26	3
Location: 200 EA	AST TANK	FARM			Exa	ım Start: 07/25/05	0924	Exam	End:	2040
Component ID:	104-AN					mination Surfa  ☑ OD ☐ ID [	ce:	Nomin: Thickn		.875"
Configuration:	KNUCK	LE TO	, ,		Cal	ihrated	.3" to 1.0"	174		AMB ^O F
Total Length Exam	ined: 47.1	,, S	can Width:	9.8"		Level Correct	ion (Trans. C	orr.):	-	0 DB
Procedure: COC	terial Type: ISS ⊠ CS O	THER.		Cond	ition: N/A					
File Name:		KNUCKLE/	I		Tra	nsducer:		. П	ANGLE	
Xo Ref. Point (Lo):	A DOVE 1	2000	<u> </u>	гисов	<u>'</u> .					
Yo Ref. Point (Wo):		end of knu horiz, weld								
Part # / Indication	X Start (in)	X Stop (in)	Y Start (in)		itop n)	Ave. Thk. (in)	Min. Thk., R. Lig. (in)	Are Repor	1	Max. Thk. (in)
0-12						.940"	.910"			.97'0"
12-24						.940"	.893"			.97'0"
24-36						.935"	.902"			.965"
36-47.1						.935"	.885"			.965"
					<del></del>					
Remarks:										
į.										
IN11 See Atta	[N1] See Attached Letter From J. B. Elder									
Examiner: W. D. Purdy Examiner: Analyst: W. H. Nelson Reviewer: J. B. Elder										
WDRudy WHDUSON [NI]										
Druds										
P-Scan Limited										

COGEMA-SVUT-INS-007.3, Rev. 2, Attachment 8

AUTOMA		RASONIC		IESS		Job #	4-41	Riser #	6		
Location:					Exa	m Start:		Exam End:			
200 E/ Component ID:	AST TANK	FARM			Eva	08/03/05 mination Surfa		Nominal	1040		
	104-AN							Thickness:	.875"		
Configuration:	KNUCK				Ran	190.	.3" то 1.0"	Temp:	AMB ⁰ F		
Total Length Exami	ned: 22.8	9" S	can Width:	10.4"	Ref.	. Level Correct	ion (Trans. Co	orr.):	0 DB		
Procedure: COO	SEMA SVU	T-INS-007.3	3 1	Rev 2	Mat	erial Type: SS 🖾 CS O	THER:	Con	dition: N/A		
File Name:		KNUCKLE/E	3		Trai	nsducer: DUAL S		E ☐ ANGL			
Xo Ref. Point (Lo):		end weld a	ttachment	, west of	24"	riser					
Started at end weld attachment, west of 24" riser  Yo Ref. Point (Wo): 2" below horiz, weld											
Part # / Indication									Max. Thk. (in)		
0-12			.920"	.878"		.950"					
12-22.89						.920"	.883*		.950"		
					_						
	<del></del>				•			1			
				<del> </del>					<del> </del>		
				-				<del>                                     </del>			
									<del> </del>		
				_							
				<del></del>		<u> </u>					
									ļ		
		]									
Remarks:											
Stop @ first vert. weld west of weld attachment											
	Stop @ first vert. weld west of weld attachment										
[N1] See Attached Letter From J. B. Elder											
Examiner W. D. Purdy Examiner: Analyst: W. H. Nelson Reviewer: J. B. Elder											
MACE	4			_   4	14	Llep	<u>N1</u>	1			
Level: <u>II</u> Date: <u>(</u>	08/03/96	Date:		Lev	el: <u>   </u>	Date: <u>08/22</u>	<u>//05</u> Lev	el: <u>III</u> Date:	<del></del>		
P-Scan Limited											

COGEMA-SVUT-INS-007.3, Rev. 2, Attachment

AUTOM		TRASONIC A REPORT		NESS		Job#	4-41	Riser# 20	3
Location:	AST TANK	FARM			Exa	m Start: 07/28/05	0841	Exam End:	4.440
Component ID:	104-AN	1 / NEXIVS		<del></del>		mination Surfa	ice:	Nominal	1412 .875"
Configuration:	KNUCK	J F TO			Cal	⊠ OD □ ID [ ibrated	.3" TO 1.0"	Thickness: Temp:	AMB ⁰ F
Total Length Exam		T C	an Width:	10.3"		nge: U . Level Correct		OFF ):	0 DB
Procedure:	•	JT-INS-007.3	,	Rev 2		terial Type:			Ition:
File Name:					Tra	ss 🛭 cs o	·········		N/A o
X _o Ref. Point (L _o ):	,	KNUCKLE/C				DUAL S		G ☐ ANGLE	<u> </u>
Yo Ref. Point (Wo)		t vert. weld,	west of w	elo attac	nmei	nt, west of 2	4" riser		
	Z" DelOW X Start	horiz. weld X Stop	Y Start	YS	OD	Ave, Thk.	Min, Thk.,	Area	Max. Thk.
Part # / Indication	(in)	(ln)	(in)	(ir		(in)	R. Lig. (in)	Reportable	(in)
0-12						.960"	.929"		.975"
12-24						.955"	.920"		.975"
24-36		<u></u>				.965"	.923"		.980"
36-48	······································					.965"	.920"		.980"
48-60.06						.960"	.914"		.980*
Remarks:									
[N1] See Attached Letter From J. B. Elder									
Examiner: W. D. Purdy Examiner: Analyst: W. H. Nelson Reviewer: J. B. Elder									
WD Fludy WHO Zelon IN11									
W D + Cural									
P-Scan Limited		····			_				

	AUTO		D ULTR ATA RE			CAN		Job #- (	04-41	Riser# 2	6
Loc	ation:	ACT TAI			System:	ISD 4	Exa	n Start:	0747	Exam End:	4540
Con	ponent ID:	451 IA	NK FARM	1	F	SP-4	Fyai	08/01/05 mination Sur		Nominal	1540
		104-A	4					םום סכ	PAINTED	Thickness:	0.8750"
	figuration:		JCKLE	то			Ran		0" то 2.5"		AMB ^o F
	I Length Exar	nined:	120"	,	Scan Width:	10.1"	_		ction (Trans.		0 DB
Pro	cedure:	GEMA :	SVUT-INS	S-007.		Rev. 2		eriai Type: SS 🖾 CS	OTHER:	Con	dition: N/A
1	Name m #:		KNUC	KLE/	45			sducer: DUAL 🔯	SGL □0D	EG 🖾 ANGL	E: 45°
•	Ref. Point (Lo)	Starte	ed @ air s	slot we	est of east	air line					
Yo Ref. Point (Wo): 2" below horiz. weld Sizing Method Angle (deg) Reference Cal. Sheet Set-Up / File Name											
	Sizing Metho	od	Angle (de	eg)	Referer	ce Cal. S	heet		Set-Up	/ File Name	· ·
1 45° SHEAR 2 60° SHEAR											
2 60° SHEAR 3 AATT											
3 AATT											
4 DUAL 0°											
INDICATION INFORMATION											
Ind.	Method	Weld Side	Depth R. Lig.	Max. Amp.	L1 (in)	Length (in)	լ2 (in)	W1 (in)	Width (in)	W2 (in) Indi	cation Type
									<u> </u>		
	····					<u> </u>		_	<del> </del>		
	<u> </u>		<del>  </del>						<u> </u>		
						<u> </u>	<del> </del>				
			1				<u> </u>				
					-						
Re	narks:										
١	No crack like indications										
[ [	[N1] See Attached Letter From J. B. Elder										
Exa	miner: W. D	. Purdy	Exam	iner:		A	nalyst: \	V. H. Nelson	ſ	viewer: J.B.	Ider
<i>\u</i>	WD Hudy WHT Clar IN11										
Lev	Level:    Date: 08/01/05   Date: Level:     Date: 08/23/05   Level:     Date:										
P	-Scan Limited	t				<u> </u>					

COGEMA-SVUT-INS-007.3, Rev. 2, Attachment 5

	AUTO		ULTRAS TA REPO		CAN			04-41	Rise	er# 26	
Loc	ation: 200 E/	AST TANK	(FARM	System:	PSP-4	Ехаг	n Start: 08/02/05	0645	Exa	m End: 1447	
Con	ponent ID:	104-AN						face:	Non Thic	ninal kness: 0.8750"	
	figuration:	KNUC	CKLE			Rang		0" то 2.5"		Temp: AMB ^O F	
Tota	I Length Exar	nined:	20"	Scan Widtl	10.1"	'		ction (Trans.	Согт):	<u>0</u> DEI	
Pro	cedure: CO	GEMA SV	/UT-INS-00	7.3	Rev. 2		erial Type: SS 🛛 CS	OTHER:	_	Condition: N/A	
/ Ite	Name m #:		KNUCKLE	/45 A			sducer: DUAL 🗵	SGL 000	EG	⊠ ANGLE: 45°	
	Ref. Paint (La)	Started	@ end of l	nuckle/45	@ 4 th air	slot we	est of east	air line			
Started @ end of knuckle/45 @ 4 th air slot west of east air line  Yo Ref. Point (Wo):  2" below horiz. weld  Sizing Method Angle (deg) Reference Cal. Sheet Set-Up / File Name											
Sizing Method Angle (deg) Reference Cal. Sheet Set-Up / File Name  1 45° SHEAR 2 60° SHEAR											
1 45° SHEAR											
3 AATT											
3 AATT 4 DUAL 0°											
INDICATION INFORMATION											
Ind.	Method				Length (in)	L2 (in)	W1 (in)	Width (in)	W2 (in)	Indication Type	
L_											
<u> </u>											
					<u> </u>			ļ <u>.</u>			
1	marks:	r. 11 41									
[	No crack like indications										
,	[N1] See Attached Letter From J. B. Elder										
	miner: W.D		Examiner:		l A	nalyst: V	V. H. Nelson	Re	viewer	: J. B. Elder	
$ \overline{\mathbf{v}} $		wald	.			WH	Nelson		1]		
Lev	_evel: <u>II</u> Date: <u>08/02/05</u> Date: Level: <u>III</u> Date: <u>08/23/05</u> Level: <u>III</u> Date:										
F	-Scan Limited	l			}						

COGEMA-SVUT-INS-007.3, Rev. 2, Attachment 5

AUTOM		RASONIC A REPORT		ESS		Job# O	4-41	Rise	er# 26	3	
Location:	AST TANK	EADM			Exa	m Start:	0004	Exa	m End:	4500	
Component ID:	104-AN	1 /74 /191			Exa	07/27/05 mination Surfa	ice:		ninal	1539	
Configuration;		TO				⊠ OD □ ID [ brated			kness: Temp:	.875"	
Total Length Exam	KNUCK	TS	can Width:		Rar	ige: 0 . Level Correct	.3" TO 1.0"			AMB °F	
Procedure:	.725			6.65"			JOH (TIBHS: O			O DB	
COC	SEMA SVU	T-INS-007.3	3   R	ev 2		erial Type: SS 🖾 CS O	THER:	_	Cond	ition: N/A	
File Name:		SLOT 2			Trai	nsducer: DUAL S	GL. 🔯 0 DEC	3	☐ ANGLE		
Xo Ref. Point (Lo):	Started at	second air	slot . west o	of east a			<u> </u>				
Yo Ref. Point (Wo):		oke @ knuc									
Part # / Indication	X Start (in)	X Stop (In)	Y Start (in)	Y Sto (in)	op	Ave. Thk. (in)	Min. Thk., R. Lig. (in)		Area portable	Max. Thk. (in)	
0725						.960"	.947"			.97/5"	
								<u> </u>			
								<u> </u>			
								-			
									<u></u>		
								-			
								╀	·		
								<del> </del>			
								<del> </del>			
				<b> </b>				+			
								╫			
					<del></del> -			+-			
Remarks:						l	<u> </u>	<u> </u>			
	remarks.										
[N1] See Atta			Elder	· .							
Examiner: W. H. Nelson											
Level: <u>III</u> Date: (	07/27/05	Date:		Leve	el: <u>  11</u>	Date: <u>08/22</u>	<u>//05</u> Lev	el: <u>   </u>	_ Date: _		
<del></del>											

COGEMA-SVUT-INS-007.3, Rev. 2, Attachment 6

AUTOM	ATED ULT	RASONIC		ESS		Job# O	4-41	Riser #	6	
Location: 200 EA	AST TANK	FARM			Exa	m Start: 07/27/05	0924	Exam End:	1539	
Component ID:	104-AN				Exa	mination Surfa	ce:	Nominal Thickness:	.875"	
Configuration:	KNUCKI	LE TO		_	Cal Rar	ibrated nge: 0	.3" то 1.0"	Temp:	AMB ^o F	
Total Length Exam	ined: 1.04	" S	can Width:	6.65"		. Level Correct	ion (Trans. C		0 DB	
Procedure: COC	SEMA SVU	T-INS-007.	3 F	Rev 2		terial Type: ISS ⊠ CS O	THER:	Con	dition: N/A	
File Name:		SLOT 7				nsducer:	3L 🛛 0 DE	G □ ANGL	E:	
Xo Ref. Point (Lo):		t , west of $\epsilon$	east air line							
Yo Ref. Point (Wo):	End of str	oke @ knu	ckle transiti	on from	pad					
Part # / Indication	X Start (in)	X Stop (in)	Y Start (in)	Y St		Ave. Thk. (in)	Min. Thk., R. Lig. (in)	Area Reportable	Max. Thk. (in)	
0-1.04						.975"	.955*		.990"	
				<u> </u>						
· "										
		<u> </u>						-		
	,									
						<u> </u>		<u> </u>	<del> </del>	
				<del>                                     </del>						
Remarks:										
[N1] See Attached Letter From J. B. Eider										
Examiner: W. H. Nelson Examiner: Analyst: W. H. Nelson Reviewer: J. B. Elder										
Examiner: W. H. Nelson   Examiner:   Analyst: W. H. Nelson   Reviewer: J. B. Elder   W. H. Nelson   Reviewer: J. B. Elder   IN11									<del></del>	
Level: <u>III</u> Date: _	07/27/05	Date	:	Le	/el: <u>11</u>	<u> </u> Date: <u>08/22</u>	2 <u>/05</u> Lev	rel: <u>III</u> Date:		

COGEMA-SVUT-INS-007.3, Rev. 2, Attachment 6

AUTOM	ATED ULT	TRASONIC	THICKNE	ESS		Job#		Rise		
	DAT	A REPORT	<del>-</del>			0	4-41	1	26	3
Location:		F 4 F 3 4			Exa	m Start:		Exa	m End:	
	AST TANK	FARM				07/27/05	0924	<u> </u>	-11	1539
	104-AN					mination Surfa ☑ OD ☐ ID [			ninal kness:	.875"
Configuration:	KNUCK		Rar	1901	.3" то 1.0	- 1	Temp:	AMB ^o F		
Total Length Exam	ined: 1.04	" Se	can Width:	6.65"	Ref	. Level Correct	ion (Trans.	Corr.):		O DB
Procedure: CO	GEMA SVU	T-INS-007.3	Re Re	ev 2		eriai Type: SS ⊠ CS O	THER:		Conc	ltion: N/A
File Name:		SLOT 8			Tra	nsducer:		<u> </u>		0
Xo Ref. Point (Lo):	Started at	8th air slot	west of ea	st air lii	·	S DOVE	<u> </u>		ANGLE	·
Yo Ref. Point (Wo)		oke @ knuc					<u> </u>			
Part # / Indication	X Start (in)	X Stop (In)	Y Start (in)	Y Sto	op q	Ave. Thk. (in)	Min. Thk. R. Lig. (In		Area portable	Max. Thk. (In)
0-1.04						.975"	.960"			.990"
								_		···
	<del></del>					-				
				ļ						
				<u> </u>		ļ		_ _		
						<u> </u>				
				<u> </u>		<del> </del>				
								-		
		<u> </u>								
					<del>-</del>					
			,			<u> </u>				
Remarks:										
Peak data										
[N1] See Atta	[N1] See Attached Letter From J. B. Elder									
Examiner: W. H. Nelson Examiner: Analyst: W. H. Nelson Reviewer: J. B. Elder										
Examiner: W. H. Neison Examiner: Analysi: W. H. Neison Reviewer: J. B. Elder  WHT Delson [N1]										
Level: III Date: _		Date:	:	-   -		Date: 08/22	_		Date:	

COGEMA-SVUT-INS-007.3, Rev. 2, Attachment 6

AUTOM	ATED ULT	TRASONIC	THICKN	ESS		Job #		Rise		
		A REPORT				O.	4-41		26	3
Location:					Exa	m Start:		Exar	n End:	-
	AST TANK	FARM				07/27/05	0924			1539
	104-AN					mination Surfa ☑ OD ☐ ID [		Nom Thic	kness:	.875"
Configuration:	KNUCK				Rar	ıg	.3" то 1.0'	.	Temp:	AMB ^o F
Total Length Exam	ined: 1.03	6" So	can Width:	3.65"	Ref	. Level Correct	ion (Trans, C	orr.):		o DB
Procedure: COC	GEMA SVU	T-INS-007.3	Re	∍v 2	Mat	terial Type: SS ⊠ CS O	THER:		Cond	ition: N/A
File Name:		SLOT 9			Tra	nsducer:		= :G Г	 ∐ ANGLE	О
Xo Ref. Point (Lo):	Started at	9th air slot	west of ea	st air lii		JUNE E	<u> </u>	<u> </u>	_ Alloca	<u>: — - —                                  </u>
Yo Ref. Point (Wo):		oke @ knuc					· · · · · · · · · · · · · · · · · · ·			
Part # / Indication	X Start (ln)	X Stop (in)	Y Start (in)	Y Sto	op go	Ave. Thk. (in)	Min. Thk., R. Lig. (in)		\rea ortable	Max. Thk. (in)
0-1.036						.970"	.954"			.990"
				<u> </u>						
						<u> </u>		L		
Remarks:										
Peak data										
INITI See Attached Letter From L. R. Elder										
[N1] See Attached Letter From J. B. Elder  Examiner: W. H. Nelson   Examiner: Analyst: W. H. Nelson   Reviewer: J. B. Elder										
								iluer		
WHI Debro WHI WHILL										
Level: 111 Date: _	07/27/05	Date:		Lev	/el: <u>   </u>	Date: <u>08/22</u>	<u>2/05</u> Le	vel: <u>III</u>	Date:	<del></del>

COGEMA-SVUT-INS-007.3, Rev. 2, Attachment 6

Docation:   200 EAST TANK FARM   System:   104-AN   Block:   444-99-30-004	,	AUTOMA	TED ULT CALIBRA				SS	Job#	+	04-41		Riser		26
COGEMA SVUT-INS-007.3   2   0.3" to 1.0"   Carbon Steel	Location	n: 200 EAS	ST TANK F	ARM	Syster	n: 104-	AN		44	4-99-30-	-004			
PSP-4   201   Block: N/A   Material: N/A	Procedu	ire: COG	EMA SVUT	Γ-INS-007	.3	Rev.	2	Thickness:	0.3'	' to 1.0"	Mat	erial:	Carl	on Steel
P-SCAN Sys. 4 1.3 2 N/A N/A  Linearity Due Date: 09/30/2005  Scanner Type: AWS-5d Serial No. 320 Couplant: Water Betch No. N/A  Scanner Cable: COAXIAL  Channel Transducer Make Nodel Freq. (N/Hz) Size Serial No. Angle (deg) Type  1 KB MSEB 5 9x2MM 02005 0 0  2 KB MSEB 5 9x2MM 01939 0 1  3	UT Syst	tem:	PSP-4	Serial N	lo.	201					1	N/A		
Scanner Type:   AWS-5d	Softwar	e Version:	P-SCAN	Sys. 4 1	.3	Rev.	2	Thickness:	1	V/A	Mat	erial:		N/A
Scanner Cable   COAXIAL   Cable Length:   80 Feet	Linearity	y Due Date:	09/30	/2005				Reference	Block	Temp:	AME	³ °F		
COAXIAL   Cable Length:   80 Feet	Scanne	r Type:	AWS-5d	Serial N	lo. 320	0		Couplant:	W	ater	Bate	ch No.		N/A
Coanter   Transducer   Model   Freq.   Size   Serial No.   Angle (deg)   Type	Scanne	r Cable:	COAXIAL					Cable Leng	gth:	80	Fee	=====		
Make   Mode	Signal (	Cable:	COAXIAL					Cable Leng	gth:	80	) Fee	∍t		
KB   MSEB   5   9x2MM   02005   0														
3	1 KB MSEB 5 9x2MM 02005 0													
INITIAL CALIBRATION			KB	MSE	В	5	8	3x2MM	01	939	0			
INITIAL CALIBRATION	3													
DATE:         06/28/05         06/28/05         06/28/05         06/28/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         07/13/05         09/13         09/13         09/														
TIME: 0903 0908 1340 1340 0735 0740 1442 1445  REFLECTOR: 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1			T											
REFLECTOR:         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .296"/odb         .1.00"/odb         .996"/odb         .1.00"/odb         .996"/odb         .1.00"/odb         .996"/odb         .1.00"/odb         .996"/odb         .996"/odb         .1.00"/odb         .996"/odb         .996"/odb         .1.00"/								· · · · · · · · · · · · · · · · · · ·			5			<del></del>
CH. 1 THK. 1		TOTOD:			+									<b></b>
CH. 1         THK. 2         1.00"/Odb         1.00"/Odb         .996"/Idb         .996"/Odb         1.00"/Odb         299"         299"         299"         299"         299"         299"         299"         299"         299"         299"         299"         299"         299"         299"         299"         299"         299"         299"         299"         299"         299"         299"         299"         299"         299"         299"         299"         299"         299"         299"         299"         299"         299"         299"         299"         299"         299"         299"         299"         299"         299"         296"/Odb         1.00"/Odb	REFLE	T	<del> </del>	1										
CH. 2 THK. 1 .302" .302" .298" .298" .299" .299" .299" .299" .299"  THK. 2 1.00"/0db 1.00"/0db .966"/0db .996"/0db 1.00"/0db 1.00"/0db .993"/0db 1.00"/-1db  CH. 3 THK. 1 .302" .302" .298" .298" .299" .299" .299" .299" .299"  THK. 2 1.00"/0db 1.00"/0db .996"/0db .996"/0db 1.00"/0db 1.00"/0db .996"/0db 1.00"/0db .996"/0db 1.00"/0db .996"/0db 1.00"/0db .996"/0db 1.00"/0db .996"/0db .996"/0db .996"/0db .996"/0db 1.00"/0db .996"/0db .996	CH. 1			<del> </del>										
CH. 2			<del> </del>	<del> </del>					···					
CH. 3         THK. 1         .302"         .302"         .298"         .298"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299"         .299" <t< td=""><td>CH. 2</td><td></td><td><del>                                     </del></td><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td>-+</td><td></td><td></td><td></td></t<>	CH. 2		<del>                                     </del>	1							-+			
THK. 2	1			- <del></del>										<u> </u>
EXAMINER: WHN WHN WHN WDP WDP WDP WDP  Remarks: CAL.T  Examiner: W. D. Purdy Level: II Date: 743/2005 Level: III Date: 6/28/05 Level: III Date: 6/28/05	CH. 3	THK. 2	1.00"/0db	1.00"/0db	.99	6"/0db	.996"/0	db 1.00"/	/Odb	1.00"/00	db dt			
EXAMINER: WHN WHN WHN WHN WDP WDP WDP WDP  Remarks: CAL.T  Examiner: W. D. Purdy Level: II Date: 743/2005 Level: III Date: 6/28/05 Level: III Date: 6/28/05	011.4	THK. 1												
Remarks: CAL.T  Examiner: W. D. Purdy Level: II Date: 743/2005   Level: III Date: 6/28/05   Level: III	Un. 4	THK. 2										•		
Examiner: W. D. Purdy  Examiner: W. H. Nelson  WH. Nelson  WH. Nelson  Level: III Date: 6/28/05 Level: III Date: 6/28/05	EXAM	EXAMINER: WHN WHN WHN WDP WDP WDP												
Level: <u>II</u> Date: 7/13/2005   Level: <u>III</u> Date: 6/28/05   Level: <u>III</u> Date: 6/2/3/05														
Level: <u>II</u> Date: 743/2005 Level: <u>III</u> Date: 6/28/05 Level: <u>III</u> Date: 6/28/05	Exami	iner: (W. D	. Purdy	E	Examin	er: W. H	l. Nelso	n	- 1			H. Ne	lson	
Level:     Date: 7/43/2005   Level:     Date: 6/28/05   Level:   Date: 8/23/05	m	DH	udy		4/4	7/	eln		-			le L.	<del>,</del>	
P-Scan Limited		<u>II</u> Date can Limited		005   L	.evel: .	<u>III</u> Da	te:	6/28/05	L	.evel: <u>   </u>	D	ate:	8/2	13/05

	NOTUA	IATED ULT CALIBRA			CKNE	SS	Job#	04-41		Riser	7# 26			
Location	n: 200 E	AST TANK F	ARM	System	^{3:} 104-	AN	Calibration Block:	444-99-30-	004					
Procedu	re: CC	GEMA SVUT	-INS-007.	3	Rev.	2	Thickness:	0.3" to 1.0"	Ma	terial;	Carbon Steel			
UT Syst	tem:	PSP-4	Serial No	).	201		Reference Block:			N/A				
Softwar	e Version	P-SCAN	Sys. 4 1.	3	Rev.	2	Thickness:	N/A	Ma	terial:	N/A			
Linearity	y Due Dat	e: 09/30	/2005				Reference	Block Temp:	AMI	3 °F				
Scanne	r Type:	AWS-5d	Serial No	320	)		Couplant:	Water	Bat	ch No.	N/A			
Scanne	r Cable:	COAXIAL	•				Cable Leng	jth: 80	Fe	et				
Signal Cable: COAXIAL Cable Length: 80 Feet														
Channel Transducer Model Freq. (MHz) Size Serial No. Angle (deg) Type														
1 KB MSEB 5 8x2MM 01997 0														
2 3 3														
4			Г.		<del> </del>									
		IBRATION		Т				N CHECKS			<del></del>			
DATE:		06/23/05	06/23/05	+	27/05	06/27/0	<del></del>							
TIME:		0855	2020	+	420	2047			_					
REFLE	ECTOR:	.3"-1.0"	.3"-1.0"	.3"	-1.0"	.3"-1.0	) ^{FI}							
CH. 1	THK. 1	299"	.299"	+	302"	.302"								
	THK.2	1.00"/0db	.997"/-1db	<del></del>	0"/Odb	1.001"/0				<del></del>				
CH. 2	THK. 1	.299"	.295"	3	302"	.302"			_					
	THK. 2	1.00"/0db	.997"/-1db	+-	0"/0db	1.001"/0			$\perp$					
CH. 3	THK. 1	.299"	.295"	+	302"	.302"			$\perp$					
	THK. 2	1.00"/Odb	.997"/-1db	1.00	0"/0db	1.004"/1	db				•			
CH. 4	THK. 1			ļ										
CTV A LA	THK. 2	1100	IAIDD	<del>                                     </del>	400	1100								
EXAM	·	WDP	WDP	\ \ \ \ \	VDP	WDP	<u> </u>				]			
Remai CAL														
Exami	ner. W.	D. Pokdy	E	kamine	er:			Reviewer:	W.,	H. Ne	Ison			
	TU	Hund	<u>.   _</u>		·····		***************************************	(CA)	2	11/2				
Level: P-So	<u>II</u> D can Limit	ate: 6/23 &ହି ed	27/05 Le	evel: _	Da	te:		Level: <u>    </u>	_ D	ate:	8/23/05			

Location   200 EAST TANK FARM   System   104-AN   Size   Thickness   0.3" to 1.0"   Material: Carbon Steel		AUTO		TED ULT CALIBRA				SS		Job#		04-41		Rise		26
COGEMA SVUT-INS-007.3   2   0.3" to 1.0"   Carbon Steel	Location	200	EAS	T TANK FA	ARM	Syster	n: 104-	-AN			44	4-99-30	0-004			
Software Version: P-SCAN Sys. 4 1.3   Rev. 2   Thickness: N/A   Material: N/A	Procedu	ıге: (	COGI	EMA SVUT	-INS-007	7.3	Rev.	2	Thic	kness:	0.3	" to 1.0	, Ma	iterial:	Carl	on Steel
P-SCAN Sys. 4 1.3   2	UT Syst	em:	F	PSP-4	Serial I	Vo.	. 405							N/A		
Scanner Type:   AGS-2	Software	e Vers	ion:	P-SCAN	Sys. 4	1.3	Rev.	2	Thic	kness:	1	N/A	Ma	iterial:		N/A
Scanner Cable   COAXIAL   Cable Length:   100   Feet	Linearity	/ Due l	Date:	09/30/	/2005				Ref	erence	Block	Temp:	AM	в ^о ғ		
COAXIAL   Cable Length:   100 Feet	Scanne	г Туре	:	AGS-2	Serial	No. 40	1		Col	ıplant:	W	/ater	Ba	tch No.		N/A
COAXIAL         100 Feet           Channel         Transducer Make         Model         Freq. (MHz)         Size         Serial No. (deg)         Wedge Type           1         KB         MSEB         5         8x2MM         02003         0           2         3         4         INITIAL CALIBRATION         CALIBRATION CHECKS           DATE:         07/12/05         07/13/05         07/13/05         07/14/05         07/14/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05         07/18/05 <td< td=""><td>Scanne</td><td>r Cable</td><td>e:</td><td>COAXIAL</td><td></td><td></td><td></td><td></td><td>Cat</td><td>ole Leng</td><td>jth:</td><td>10</td><td>0 Fe</td><td>et</td><td></td><td></td></td<>	Scanne	r Cable	e:	COAXIAL					Cat	ole Leng	jth:	10	0 Fe	et		
Type	Signal C	Cable:		COAXIAL					Cat	ole Leng	jth:	10	0 Fe	et	•	
1 KB MSEB 5 8x2MM 02003 0  2 3	Chann	Channel Make Model (MHz) Size Senai No. (deg) Type														
3	1 KB MSEB 5 8x2MM 02003 0															
INITIAL CALIBRATION	2															
INITIAL CALIBRATION	3															
DATE: 07/12/05 07/13/05 07/13/05 07/13/05 07/14/05 07/14/05 07/18/05 07/18/05 TIME: 1335 1942 0813 1430 0956 2224 0903 2046 REFLECTOR: 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0" 3"-1.0"  CH. 1 THK. 1 303" 298" 303" 303" 301" 301" 303" 298"  THK. 2 1.00"/0db .997"/1db 1.00"/0db 1.00"/2db 1.00"/0db .997"/0db 1.00"/0db .995"/-2d  CH. 3 THK. 1 298" 297" 303" 303" 298" 296" 303" 298"  CH. 4 THK. 2 1.00"/0db .997"/1db 1.00"/0db 1.00"/2db 1.00"/0db .997"/0db 1.00"/0db .995"/-2d  CH. 4 THK. 1 THK. 2 EXAMINER: WHN WHN WHN WHN WHN WHN WHN WHN WHN Remarks:  CAL. T2  Examiner: W. H. Nelson Examiner: Reviewer: W. H. Nelson WHM WHM WHM				1						D 1 716		litrous contract			<u> </u>	
TIME: 1335 1942 0813 1430 0956 2224 0903 2046  REFLECTOR: .3"-1.0" .3"-1.0" .3"-1.0" .3"-1.0" .3"-1.0" .3"-1.0" .3"-1.0" .3"-1.0" .3"-1.0" .3"-1.0" .3"-1.0" .3"-1.0" .3"-1.0" .3"-1.0" .3"-1.0" .3"-1.0" .3"-1.0" .3"-1.0" .3"-1.0" .3"-1.0" .3"-1.0" .3"-1.0" .3"-1.0" .3"-1.0" .3"-1.0" .3"-1.0" .3"-1.0" .3"-1.0" .3"-1.0" .3"-1.0" .3"-1.0" .3"-1.0" .3"-1.0" .3"-1.0" .3"-1.0" .301" .303" .298" .298" .303" .301" .301" .303" .303" .303" .301" .303" .298" .298" .303" .303" .303" .301" .303" .298" .298" .298" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303" .303"			ALIBI			.						T	T			
REFLECTOR:         3"-1.0"         3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .3"-1.0"         .30"-1.0"         .30"         .298"         .298"         .298"         .303"         .303"         .301"         .303"         .298"         .298"         .298"         .298"         .298"         .298"         .298"         .298"         .298"         .298"         .298"         .298"         .298"         .298"         .298"         .298"         .298"         .298"         .298"         .298"         .298"         .298"         .298"         .298"         .298"         .298"         .298"         .298"         .298"         .298"         .298"         .298"         .298"         .298"         .298"         .298" <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>·</td> <td></td> <td></td> <td></td> <td></td>												·				
CH. 1 THK. 1 .303"		CTO	D.	<del></del>								-				
CH. 1 THK. 2 1.00"/0db .997"/1db 1.00"/0db 1.00"/2db 1.00"/0db .997"/0db 1.00"/0db .997"/2d  CH. 2 THK. 1 .303" .298" .303" .303" .303" .301" .303" .303" .301" .303" .303" .301" .303" .298"  THK. 2 1.00"/0db .997"/1db 1.00"/0db 1.00"/2db 1.00"/0db .997"/0db 1.00"/0db .997"/0db 1.00"/0db .997"/0db 1.00"/0db .997"/0db 1.00"/0db .997"/0db 1.00"/0db .997"/0db 1.00"/0db .995"/-2d  CH. 4 THK. 1 THK. 2  EXAMINER: WHN WHN WHN WHN WHN WHN WHN WHN WHN WHN	KEFLE											<del> </del>				
CH. 2         THK. 1         .303"         .298"         .303"         .303"         .301"         .303"         .298"           THK. 2         1.00"/0db         .997"/1db         1.00"/0db         1.00"/0db         .997"/0db         1.00"/0db         .995"/-2d           CH. 4         THK. 1         THK. 1         .997"/1db         1.00"/0db         1.00"/0db         .997"/0db         1.00"/0db         .995"/-2d           EXAMINER:         WHN	CH. 1											<del> </del>				
CH. 2 THK. 2 1.00"/0db .997"/1db 1.00"/0db 1.00"/2db 1.00"/0db .997"/0db 1.00"/0db .997"/2dd 1.00"/0db .997"/0db 1.00"/0db .997"/2dd 1.00"/0db .997"/0db 1.00"/0db .997"/2dd 1.00"/0db .997"/0db 1.00"/0db .997"/0db 1.00"/0db .995"/-2d												<del> </del>				
CH. 3         THK. 1         .298"         .297"         .303"         .303"         .298"         .296"         .303"         .298"           THK. 2         1.00"/0db         .997"/1db         1.00"/0db         1.00"/0db         .997"/0db         1.00"/0db         .995"/-2d           CH. 4         THK. 1         THK. 2         THK. 3         THK. 3         THK. 4	CH. 2												$\rightarrow$			
CH. 3 THK. 2 1.00"/0db .997"/1db 1.00"/0db 1.00"/2db 1.00"/0db .997"/0db 1.00"/0db .995"/-2d  CH. 4 THK. 1	<b></b>								<del></del>			+				
CH. 4 THK. 1 THK. 2  EXAMINER: WHN WHN WHN WHN WHN WHN WHN WHN WHN Remarks: CAL.T2  Examiner: W. H. Nelson WHY Melson	CH. 3		<del></del>													
EXAMINER: WHN WHN WHN WHN WHN WHN WHN WHN WHN WHN		<u> </u>		1.00 (00.0	.997 / Lu	1.0	o /ugb	1.00 12	COD .	1.00 /	Vub	.35/ /	apı	1.00 /	OGD	.995 /-200
EXAMINER: WHN WHN WHN WHN WHN WHN WHN WHN WHN  Remarks: CAL.T2  Examiner: W. H. Nelson  WHY Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  CUH. Meen  C	CH. 4	<del> </del>										<u> </u>				
Remarks: CAL.T2  Examiner: W. H. Nelson  W. H. Nelson  CULD. Meta-	EXAM	<b></b>		WHN	WHN		VHN	WHN	<u>,                                    </u>	WH	N	WHI	<u>-</u>	WH		WHN
Examiner: W. H. Nelson Examiner: Reviewer: W. H. Nelson  WHY Jelan CUH, Melson			•		1							1				L
Examiner: W. H. Nelson Examiner: Reviewer: W. H. Nelson  WHY Lesson  WHO Delson																
WHY Jeen WHY Jes																
	Exami	ner:	W. H.	Nelson		Examin	er:				T			1		
Level: III Date: 7/12-18/05 Level: Date: Level: III Date: Date:	WH	42	[led	m							_   .		<del></del>			£ <u> </u>
8(25/05	Level:	<u>III</u>	Date	e: 7/12-18	3/05	Level: _	Da	ate:			i	Level: _l	<u>II</u> [	Date:	8/2	23/05

	NOTU	IATED ULT CALIBRA	RASONIC			SS		Job#		04-41		Riser		26
Location	200 E	AST TANK F	ARM	Syster	n: 104-	AN		bration lock:	44	4-99-30	-004			
Procedu	re: CC	GEMA SVU	T-INS-007.3	}	Rev.	2	Thic	ckness:	0.3	' to 1.0"	Ma	terial:	Cart	on Steel
UT Syst	em:	PSP-4	Serial No.	•	201			erence llock:				N/A		
	e Version	P-SCAN	l Sys. 4 1.3	3	Rev.	2	Thic	ckness:	. 1	N/A	Ma	terial:		N/A
Linearity	/ Due Da	te: 09/30	)/2005				Ref	erence l	Block	Temp:	AMI	в ^о F		
Scanner	Туре:	AWS-5D	Serial No	310	0		Col	ıplant:	W	ater	Bat	ch No.		N/A
Scanner	Cable:	COAXIAL	-				Cat	ole Leng	th:	80	) Fe	et		
Signal C	able:	COAXIAI					Cat	le Leng	ttn:	80	) Fe	et		
Channel Transducer Model Freq. Size Serial No. Angle (deg) Type														
Channel         Make         Model         (MHz)         Size         Senarivo.         (deg)         Type           1         KB         MSEB         5         9x2MM         01997         0														
1         KB         MSEB         5         9x2MM         01997         0           2         KB         MSEB         5         8x2MM         02005         0														
3														
4														
INIT	IAL CAL	IBRATION		T		C/	ALIB	RATIO	N CH	IECKS	<del></del>	· · · · <u> </u>		
DATE:		07/18/05	07/18/05	07/	/18/05	07/18/0	05	07/19	/05	07/19/0	)5	07/19	/05	07/19/05
TIME:		0820	0828	1	935	1940		072	5	0730		144	1	1443
REFLE	CTOR:	.3"-1.0"	.3"-1.0"	.3	"-1.0"	.3"-1.0	)"	.3"-1	.0"	.3"-1.0	)"	.3"-1.	.0"	.3"-1.0"
CH. 1	THK. 1	.295"	.299"		303"	.303'	"	.299	)" 	.303'	<u> </u>	.292	2**	.298"
	THK, 2	1.00"/0db	1.00"/0db	1.0	0"/2db	.996"/-1	db	1.00"/	0db	.1.00"/0	db	.993"/	1db	.989"/1db
CH. 2	THK. 1	.295"	.299"		299"	.299	•	.299	<del>)</del> "	.299	<u>'</u>	.292	2"	.292"
	THK. 2	1.00"/0db	1.00"/0db	.99	6"/2db	.996"/-1	db	1.00"/	0db	1.00"/0	db	.993"/	1 db	.993"/1db
CH. 3	THK. 1	.295"	.299"		299"	.295'	7	.303	3" 	.303'	<u>'</u>	.299	<b>)</b> "	.292"
	THK. 2	1.00"/0db	1.00"/0db	1.00	04"/2db	.993"/-1	db	1.00"/	0db	1.00"/0	ďb	.993"/	0db	.993"/1 db
CH. 4	THK. 1			<u> </u>										
	THK. 2			ļ										
EXAM		WDP	WDP	Į V	WDP	WDF		WD	P	WDF	<u>'                                    </u>	WD	P	WDP
Remar														
CAL	13													
Exami	ner: V	- B. Purdy	Ex	amin	er:				Ī	Reviewe				
<u>u</u>	$\mathcal{D}_{i}$	Hudy	<b>_</b>   _						_ 2	(14)	21	el		
Level:		Date: 7/18 &	1 <b>9</b> /05 Le	vel: _	Da	ite:			1	_evel: <u>li</u>	<u>l</u> E	ate:	8/	23/05
L-20	an Limi	(CA											- • •	- 7(-)

A	UTOM	TED ULT				ESS		Job#		04-41		Rise		26
Location:	200 EA	ST TANK F	ARM	Syster	n: 104	-AN		ibration Block:	44	4-99-30	0-004			
Procedure	e: COG	EMA SVUT	-INS-007.	3	Rev.	2	Thi	ckness:	0.3	' to 1.0	" Ma	iterial:	Cart	oon Steel
UT Syste	m:	PSP-4	Serial No	).	206	}		erence liock:				N/A		
Software			Sys. 4 1.	3	Rev.	2	Thic	ckness:	l	V/A	Ma	terial:		N/A
Linearity i	Due Date:	10/30	/2005				Ref	erence	Block	Temp:		в ^о ғ		
Scanner '		AWS-5D	Serial No	. 30 ⁹	9	·	<u> </u>	ıplant:		ater	Ba	tch No.		N/A
Scanner	Cable:	COAXIAL					Cal	ole Leng	th:	8	0 Fe	et		
Signal Ca	ible:	COAXIAL					Cal	ole Leng	th:	8	0 Fe	et		
Channe	l Tr	ansducer Make	Model		Freq. (MHz)		Size	)	Ser	al No.		gle eg)		Wedge Type
1		KB	MSEB		5		x2M	M	02	2005		0		
2														·
3												······	ļ	
4					<u></u>									1
	AL CALIE	RATION				C,	ALIB	RATIO	N CH	ECKS				,
DATE:		07/25/05	07/25/05	07	/26/05	07/26/	05	07/27	/05	07/27	05	07/28	/05	07/28/05
TIME:		0924	2040		721	1440	)	092	4	153	9	084	1	1412
REFLEC	CTOR:	.3"-1.0"	.3"-1.0"	.3	"-1.0"	.3"-1.0	)" <u> </u>	.3"-1	.0"	.3"-1.	0"	.3"-1	.0"	.3"-1.0"
CH. 1	THK. 1	.303"	.306"		303"	.299	*	.303	3"	.295	j"	.299	)"	.299"
<b>V</b> 11	THK. 2	1.00"/0db	1.004"/-2db	1.0	0"/0db	1.00%-2	≥db	1.00"/	0db	.1.00"/-	2db	1.00"/	0db	.996"/0db
CH. 2	THK. 1	.303"	.306"		303"	.303	*	.303	3"	.299	<b>)</b> "	.299	)"	.299"
011.2	THK. 2	1.00"/0db	1.004"/-1db	1.0	0"/0db	1.00"/-2	≥db	1.00"/	0db	1.00"/-	2db	1.00"/	0db	.996"/-1db
CH. 3	THK. 1	.299"	.299"		303"	.303	lt .	.303	3"	.299	)*	.299	3"	.299"
511.3	THK. 2	1.00"/0db	1.00"/-1db	1.0	0"/0db	1.004"/-	2db	1.00"/	0db	.996"/-	2db	1.00"/	0db	1.00"/-1db
CH. 4	THK. 1													
<b>ОП.</b> Т	THK. 2													
EXAMI	VER:	WDP	WDP	V	NDP	WDF	•	WH	N	WH	N	WD	Р	WDP
Remark CAL.														
Examin	er: W.D	). Pardy	E	camin	er: W. I	H. Nelso	n		f	Reviewe	r. W.	H. Ne	Ison	
\	<u>u</u>	27 G	اليك	<u> </u>	477	lels			_   -	(1)7	4) 2	De	-	
Level: _ P-Sca	<u>ll</u> Dat an Limite		3/05 Le	evel: _	<u>III</u> Da	ate:	7/27	7/05	l	.evel: _l	<u>III</u> [	Date:	81	23/05

		(	TED ULT CALIBRA	TION			SS		Job#		04-41		Rise		26
Location	^{n:} 200	EAS	T TANK F.	ARM	Syste	m: 104	-AN		ibration Block:	44	4-99-30	D-004			
Procedu	Ire:		MA SVUT		07.3	Rev.	2	Thic	ckness:	0.3	" to 1.0	, Ma	iterial:	Cart	on Steel
UT Syst	tem:	P	SP-4	Seria	l No.	405/2	01		erence Block:			<del></del>	N/A		
Softwar	e Versio	on:	P-SCAN	Sys. 4	1.3	Rev.	2		ckness:	l	N/A	Ma	terial:		N/A
Linearity	y Due D	Date:	09/30	/2005	. ·	1	······································	Ref	erence	Block	Temp:	AM	в ^о ғ		
Scanne	r Type:			Seria	I No. 40	1/310		Col	ıplant:	W	/ater	Ва	tch No.		N/A
Scanne	r Cable	:	COAXIAL			<del></del>		Cat	ole Leng	th:	10	0 Fe	et		
Signal C	Cable:		COAXIAL					Cal	ole Leng	th:	10	0 Fe	et		
Chann	Channel Transducer Model Freq. Size Serial No. Angle (deg) Type														
1	Make         (MHz)         (deg)         Type           1         KB         MSEB         5         8x2MM         02003         0														
2	2														
3			'KB	MS	EB	5	9	9x2M	IM :	02	2005	(	0		
4		4115		····					D 1 7 1 0						
		ALIBI	RATION					f	RATIO			T			
DATE:	:		07/19/05	07/19/	<del></del>	/20/05	07/20/		07/21		07/21/		07/21		07/21/05
TIME:			0815	1430	<del></del>	0835	2016		081	<u> </u>	135		074		1350
REFLE			.3"-1.0"	.3"-1.0		5"-1.0"	.3"-1.0		.3"-1		.3"-1.	<del></del>	.3"-1		.3"-1.0"
CH. 1	THK.		,303"	.305		301"	.303		.298		.301	<del></del> +	.302		.302"
	THK.		1.00"/0db .303"	1.002"/-		00"/0db 301"	1.005"/-		1.00"/		1.00"/-		1.007/		.991"/0db .302"
CH. 2	THK.		1.00"/0db	1.002"/-		00"/0db	1.005"/-		1.00"/		1.00"/-		1.00"/		.994"/0db
0110	THK.	1	.303"	.305		301"	.298	,	.298	3"	.301		.302	2"	.306"
CH. 3	THK.	2	1.00"/0db	1.005"/-	1db 1.0	00"/0db	.997"/0	)db	1.00"/	0db	1.00"	/-2	1.00"/	0db	.997"/0db
CH. 4	THK.	1													
	THK.	2							· ·		ļ				
EXAM	INER:		WHN	WHI	<b>V</b>	WHN	WHI	V	WH	N	WH	N	WD	P	WDP
Remai CAL *Tra	T5	cer#	02005 use	d on 7/2	21/05 by	WDP									
Exami	ner: V	Λ(, <del>D.</del>	Rurdy ,		Examin	er: W. I	H. Nelso	ກ		ł	Reviewe	r: W.	H. Ne	lson	
L	<u>1 c</u>	<u>7</u> -	and	4	W	17.	lelon			_   _	W	47	Det		
Level: P-So	<u>  </u> can Lin	Date nited	: 7/21/	した	Level:	<u>]  </u> Da	ate: 7	7/19-2	21/05		_evel: _l	<u>u</u> c	Date:	Bl:	23/05

-	MOTUA	ATED ULT CALIBRA	RASONIC ATION SH		CKNE	SS	Job		04-41		Riser	# 26		
Location	¹ 200 EA	ST TANK F	ARM	System	n: 104- <i>/</i>	AN	Calibration Block:	on 44	4-99-30-	004				
Procedu	ire: COC	EMA SVUT	Γ-INS-007.3	3	Rev.	2	Thicknes	s: 0.3	" to 1.0"	Mat	erial:	Cartion Steel		
UT Syst	tem:	PSP-4	Serial No.		201		Reference Block:	e			N/A	<del> </del>		
Softwar	e Version:	P-SCAN	l Sys. 4 1.3	3	Rev.	2	Thicknes		N/A	Mat	erial:	N/A		
Linearth	y Due Date:	09/30	/2005				Referenc	e Block	Temp:	AME	³°F			
Scanne	г Туре:	AWS-5d	Serial No	310	)		Couplant	W	ater	Bate	ch No.	N/A		
Scanne	r Cable:	COAXIAL			•		Cable Le	ngth:	80	Fee	et			
Signal C	Cable:	COAXIAL	•	**.			Cable Le	ngth:	80	Fee	et			
Chann	Channel Transducer Model Freq. Size Serial No. Angle (deg) Type													
1	1 KB MSEB 5 8x2MM 01939 0													
2														
	2													
4												L		
	IAL CALIE	7	<u> </u>	T			ALIBRATI	ION CH	TECKS	·				
DATE:		07/14/05	07/14/05		03/05	08/03/0			<b></b>					
TIME:	OTOD:	0755	1857	<del>-</del>	635	1040								
REPLE	ECTOR:	.3"-1.0"	.3"-1.0"	_	-1.0"	.3"-1.0	<del></del>			-				
CH. 1	THK. 1 THK. 2	.302"	.299"	<del>                                     </del>	299"	.299	<del></del>		<u> </u>	$\dashv$				
	THK. 1	1.00"/0db	1.001"2db	<del>                                     </del>	0"/0db	.996"/-2 '295.								
CH. 2	THK. 2	1.00"/0db	.299" .997"/2db	<del>                                     </del>	299" 0"/0db	.993"/-1					-			
<u> </u>	THK. 1	.302"	.997 7200	1	299"	.295			<del></del>	_				
CH. 3	THK, 2	1.00"/0db	1.001"/2ďb	<del> </del>	0"/Odb	.996"/-1								
	THK. 1	1	1.501.245	1	7,042				<del> </del>	<del>-  -</del>				
CH. 4	THK. 2	1		1					†	1				
EXAM	INER:	WDP	WDP	V	VDP	WDF	,		1					
Remai CAL *Tra	T6	#02005 use	ed on 8/3/05	5					•			J		
1 .	iner: W. I	Purdy	Ex	amine	er:				Reviewer	W.	H. Ne 7	ison		
1 <u> </u>	<u> </u>	Ture						.	WH.	K	el			
Level: P-So	<u>∥</u> Da can Limite		/3/ <b>05)</b> Le	vel: _	Dat	le:			_evel: <u>   </u>	_ D	ate:	8/23/05-		

	A	-	MATED U						Job#		04-41		Riser #	[#] 26
Location	n: 20	0 EAS	ST TANK F	ARM	Syster	n: 104- <i>P</i>	N		ibration ilock:	44	4-99-30	00-0	1/002	
Procedi	ure:	COGE	MA SVUT	-INS-007.	3	Rev.	2	Thic	ckness:		1.0"	M	laterial:	Carbon Steel
UT Sys	tem:	F	PSP-4	Serial I	No.	201			erence Block:				N/A	, , , , , , , , , , , , , , , , , , , ,
Softwar	re Ve	sion:	P-SCAN	l Sys. 4 1	1.3	Rev.	2		ckness:		N/A	M	laterial:	N/A
Linearit	•		06/30	/2005				Ref	erence	Block	Temp:	A۱	∕B °F	
Scanne	er Typ	e:	AWS-5d	Serial (	No. 31	0		Cou	ıplant:	V	/ater	В	atch No.	N/A
Scanne	er Cal	le:	COAXIAL					Cat	ole Leng	jth:	8	0 F	eet	
Signal (	Cable	:	COAXIAL			•		Cal	ole Leng	jth:	8	0 F	eet	
Chann	Channel Transducer Model Freq. Size Serial No. Angle (deg) Nom. / Act. Type  1 KB MWB 4 8x9mm 03242 45													
	Make (MHz) Nom. / Act. Type													
	2 KB MWB 4 8x9mm 03286 45													
	<b>.</b>		*KB	MWI		4	1	-			3132		45	
4			<u>*KB</u> RATION	MWI	3	4		<u> </u>			3247		45	
		CALIBI									HECKS			т.
DATE:	<del>-</del>		06/23/05	06/23/05		/27/05	06/27/0	5	07/21		07/21/			
TIME:			0905	2025	1	435	2053		075	0	135	6		
REFLI ORIEN			.050" Notch	.050" Notch	1 .	050" lotch	.050" Notch		.050 Note	_	.050 Note			
CH. 1	AMP	LITUDE	80%/0db	80%/-2dl	o 80°	%/0db	80%/1d	lb	80%/	0db	80%/-	lďb		
Cn. I	roc	ATION	1.414"	1.414"	1.	.414"	1.404"	•	1.41	4"	1.41	4"		
CH. 2	AMP	LITUDE	80%/0db	80%/-2dl	80	%/0db	80%/0d	lb	80%/	Odb	80%/2	2db		
	roc	ATION	1.414"	1.407"	1	.414"	1.411	<u> </u>	1.41	4"	1.41	B"		
CH. 3	AMP	LITUDE												
	roc	ATION									ļ			
CH. 4	AMP	LITUDE									<u> </u>			
	1	ATION					· · · ·				ļ <u>.</u>			
EXAM	IINE	₹;	WDP	WDP	1	NDP	WDP		WD	Р	WD	Ρ _		
Rema CAI *Tra	L.P	ucer#	3132 & 03	247 used	on7/2	1/05								
Exami	iner:	W.D.	Pardy	111	Examin	er:		<del> </del>			Reviewe	r: W	/. H. Ne	lson
Level:	11	Date	6/23-2	7/05	Levei:	Dat	e:			-   :	<i></i> Level: _l	IJ <u>Z</u> , <u>II</u>	Date:	$\sim$ $\sim$ $\sim$ $\sim$ $\sim$ $\sim$ $\sim$ $\sim$ $\sim$ $\sim$
		imited												8/23/05

	A		MATED U						Job#		04-41		Riser		6
Location	n: 20	00 EAS	ST TANK F	ARM	Syster	n: 104-A	N		ration ock:	44	14-99-3	0-00	1/002		
Procedu	ILE:		MA SVUT		.3	Rev.	2		cness:		1.0"	М	aterial:	Carl	oon Steel
UT Syst	tem:	F	PSP-4	Seriai i	No.	201			rence ock:				N/A		4
Softwar	re Ve	sion:	P-SCAN	Sys. 4	1.3	Rev.	2		kness:		N/A	M	aterial:		N/A
Linearit	y Due	Date:	06/30	72005		<del>-1</del>		Refe	rence	Bloc	(Temp:	ΑN	⁄⁄B [©] F		
Scanne	r Typ	e:	AWS-5d	Serial	No. 31	0		Coup	olant:	ν	Vater	В	atch No.	.,	N/A
Scanne	r.Cab	ole:	COAXIAL				1	Çabl	e Leng	th:		10 F	eet		
Signal 0	Cable	<u> </u>	COAXIAL					Cabl	e Leng	th:	8	80 F	eet		
Chann	nel		nsducer Make	Mode	el	Freq. (MHz)		Size		Se	riai No.		e (deg) h. / Act.		Wedge Type
1 KB MWB 4 8x9mm 03333 45 2 KB MWB 4 8x9mm 03329 45															
TO MATE TO SACITATI SOCIO TO															
3 4															
INIT															
DATE:															
TIME.			0916	2051	6	820	1433		084	5	201	9	981	9	1400
REFLE			.050" Notch	.050" Notch		050" lotch	.050" Notch	,	.050 Note		.050 Note		.050 Note		.050* Notch
·CH. 1	AMP	LITUDE	80%/0db	80%/1dl	80	%/0db	80%/0d	b	80%/0	Odb	80%/(	db	80%/0	db	80%/-1db
0,1	LOC	ATION	1.414"	1.391"	1.	.414"	1.413"	,	1.41	4°	1.40	5*	1.41	4"	1.396"
CH. 2	AMP	LITUDE	80%/0db	80%/1dl	90	%/0db	80%/1d	Ь	80%/0	Odb	80%/-	1db	80%/0	)db	80%/0db
	FGC	ATION	1.414"	1.421"	1.	414"	1.399"	<u>'</u>	1.41	4"	1.40	1"	1.41	4"	1,396"
CH. 3	AMP	LITUDE							· · · · · · · · · · · · · · · · · · ·		ļ				
	· · ·	ATION		ļ							<u> </u>		<u> </u>		
CH. 4	-	LITUDE ATION									<u> </u>				
EXAM	<u> </u>		WHN	WHN	V	VHN	WHN		WH	N	WH	N	WH	N ·	WHN
Rema			1	1	1						1	•	1 4 4 5 11		
Exami	iner:	W.H.	Nelson		Examin	er:		·····			Reviewe	r: W	/. H. Ne	lson	
Level:	111	Date	2: 7/18-2	1/05	Level:	Date	<b>9</b> :			_	Level: _	<u> </u>	Date:	31	23/05

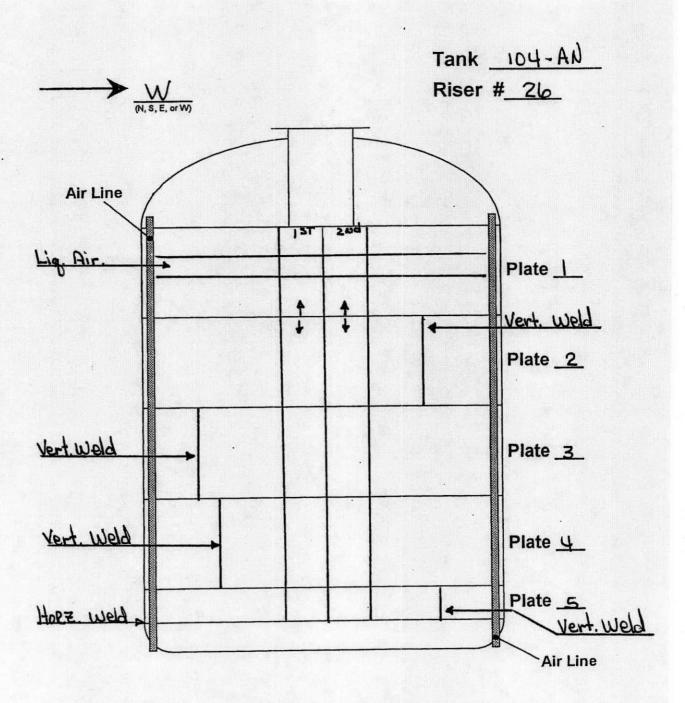
	At		_	LTRASONIC ATION SHEI			Job#	04-41		Riser #	# 26		
Location	n: 20	00 EAS	ST TANK F	ARM Sys	stem: 104-Al	N C	alibration Block:	444-99-3	0-00	1/002			
Procedu	иге:	COGE	MA SVUT	-INS-007.3	Rev.	T	nickness:	1.0"	М	aterial:	Carbon Steel		
UT Sys	tem:		PSP-4	Serial No.	201	R	eference Block:			N/A			
Softwar	re Vei	rsion:	P-SCAN	Sys. 4 1.3	Rev.	<u>T</u>	hickness:	N/A	М	aterial:	N/A		
Linearit	y Due	e Date:	09/30	)/2005		R	eference	Block Temp:	AN	1B ^o F			
Scanne	г Тур	e:	AWS-5d	Serial No.	310	С	ouplant:	Water	В	atch No.	N/A		
Scanne	r Cab	ole:	COAXIAL	_		C	able Leng	jth:	30 F	eet			
Signal Cable: COAXIAL Cable Length: 80 Feet  Transducer Freq. City Angle (deg) Wedge													
Channel Transducer Model Freq. Size Serial No. Angle (deg) Wedge Nom. / Act. Type													
Channel         Make         Model         (MHz)         Size         Serial No.         Nom. / Act.         Type           1         KB         MWB         4         8x9mm         03334         45													
2			KB	MWB	4	8x9	mm	3142		45			
3			KB	MWB	4		MM	03247		<u>45</u>			
4			KB	MWB	4		MM	3140		45			
		CALIB	RATION	ļ		CALI	BRATIO	N CHECKS					
DATE:	<u> </u>		06/30/05	06/30/05									
TIME:			0925	1305			<u> </u>						
REFLE ORIEN			.050" Notch	.050" Notch									
	AMP	LITUDE	80%/0db	80%/0db									
CH. 1	LOC	ATION	1.414"	1.414"		·							
	AMP	LITUDE	80%/0db	80%/0db									
CH. 2	LOC	ATION	1.414"	1.414"									
011.0	AMP	LITUDE	80%/0d	80%/-1db									
CH. 3	LOC	ATION	1.414"	1.414"									
CH. 4	AMP	LITUDE	80%/0db	80%/2db									
Un. 4	roc	ATION	1.414"	1.414"									
EXAM	IINE	₹:	WDP	WDP									
Rema CAL	rks: L.P2				<u>"</u>			•					
Exami	iner:	W. D.	Ruidy	Exan	niner:	·		Review	er: W	. H. Ne	Ison		
	V	<u> 红し</u>	s Hu	<u>du</u>  _				_ W	4) 7	Jel			
Level: P-S		Date Limited		05 Leve	il: Date	); 		Level:	<u>III</u>	Date:	8/23/05		

	Al		IATED U CALIBR					Job#	04-41		Riser	# 26		
Location	n: 20	0 EAS	ST TANK F	ARM	Syster	n: 104-A	N (	Calibration Block:	444-99-3	0-001	1/002			
Procedu	ıre:	COGE	MA SVUT	-INS-007.	3	Rev.	2	hickness:	1.0"	M	aterial:	Carbon Steel		
UT Syst	tem:	F	PSP-4	Serial N	lo.	201	1	Reference Block:			N/A			
Softwar	e Ver	sion:	P-SCAN	l Sys. 4 1	.3	Rev.	2	hickness:	N/A	M	aterial:	N/A		
Linearit	y Due	Date:	09/30	)/2005		-		Reference	Block Temp:	AM	ıв ^о ғ	***		
Scanne	г Тур	e:	AWS-5d	Serial N	lo. 31	0	٠	Couplant:	Water	Ва	atch No.	N/A		
Scanne	r Cab	ole:	COAXIA				- 1	Cable Len	gth:	80 Fe	eet			
Signal (	Cable	:	COAXIAI		. , ,			Cable Len	ath:	80 Fe				
Chann	Channel     Transducer Make     Model     Freq. (MHz)     Size     Serial No. Nom. / Act.     Angle (deg) Nom. / Act.     Wedge Type       1     KB     MWB     4     8x9mm     03327     45													
Channel         Transducer Make         Model         Freq. (MHz)         Size         Serial No.         Angle (deg) Nom. / Act.         Wedge Type           1         KB         MWB         4         8x9mm         03327         45           2         KB         MWB         4         8x9mm         3132         45           3         KB         MWB         4         8X9MM         03334         45														
Charmer         Make         Modes         (MHz)         Size         Serial No.         Nom. / Act.         Type           1         KB         MWB         4         8x9mm         03327         45           2         KB         MWB         4         8x9mm         3132         45           3         KB         MWB         4         8X9MM         03334         45           4         KB         MWB         4         8X9MM         03247         45														
2         KB         MWB         4         8x9mm         3132         45           3         KB         MWB         4         8X9MM         03334         45														
3 KB MWB 4 8X9MM 03334 45 4 KB MWB 4 8X9MM 03247 45														
	2         KB         MWB         4         8x9mm         3132         45           3         KB         MWB         4         8X9MM         03334         45           4         KB         MWB         4         8X9MM         03247         45           INITIAL CALIBRATION         CALIBRATION CHECKS													
2         KB         MWB         4         8x9mm         3132         45           3         KB         MWB         4         8X9MM         03334         45           4         KB         MWB         4         8X9MM         03247         45           INITIAL CALIBRATION         CALIBRATION CHECKS           DATE:         07/20/05         07/20/05         07/20/05         07/20/05														
TIME:			0906	2015	. l			. L						
REFLE			.050" Notch	.050" Notch										
	AMP	LITUDE	80%/0db	80%/0db				1						
CH. 1	LOC	ATION	1.414"	1.414"							······································			
	AMP	LITUDE	80%/0db	80%/0db										
CH. 2	LOC	MOITA	1.414"	1.414"	1									
011.0	AMP	LITUDE	80%/0d	80%/-2dt	,									
CH. 3	LOC	ATION	1.414"	1.414"										
	AMP	LITUDE	80%/0db	80%/-1dt	,									
CH. 4	LOC	ATION	1.414"	1.405"			***							
EXAM	INE	₹:	WDP	WDP										
Rema CAL	rks: P3			•		<u> </u>		<u> </u>						
Exami	iner:	W. D.	Pordy	N E	xamin	er:			Review	er: W	7	lson		
	ب	<u>در ر</u>	TUN	- Luk					_ WX	<u> </u>	10/2			
Level: P-So	_	Date imited.	e: 7/20/	105	_evel: _	Date	9:		Level:	Ш	Date: {	3/23/05		

	AUT		IATED UI CALIBRA			-SCAN			b#	04-41		Riser #	‡ 26		
Location	n: 200	EAS	T TANK F	ARM	System	104-A	AN .	Calibra Bloc		444-99-3	0-00	1/002			
Procedu	ure: CC	OGE	MA SVUT	INS-007	3	Rev.	2	Thickne	ess:	1.0"	М	aterial:	Carbon Steel		
UT Syst	tem:	F	PSP-4	Serial I	No.	405		Refere Bloc				N/A			
Softwar	e Versio	on:	P-SCAN	Sys. 4	1.3	Rev.	2	Thickn	ess:	N/A	M	aterial:	N/A		
Linearity	y Due D	ate:	09/30	/2005				Refere	nce Blo	ock Temp:	ΑN	∕⁄B ^O F			
Scanne	г Туре:		AGS-2	Serial	No. 401	j		Couple	int:	Water	В	atch No.	N/A		
Scanne	r Cable:		COAXIAL		· · ·			Cable I	Length	: 10	00 F	eet	,		
Signal C	Cable:		COAXIAL					Cable	Length	: 10	00 F	eet			
Chann	Channel     Transducer Make     Model     Freq. (MHz)     Size     Serial No. Nom. / Act.     Angle (deg) Nom. / Act.     Wedge Type       1     KB     MWB     4     8x9mm     3142     45														
Channel Make Moder (MHz) Size Selial No. Nom. / Act. Type															
Channel         Make         Moder         (MHz)         Size         Serial No.         Nom. / Act.         Type           1         KB         MWB         4         8x9mm         3142         45           2         KB         MWB         4         8x9mm         3140         45															
	1 KB MWB 4 8x9mm 3142 45 2 KB MWB 4 8x9mm 3140 45 3 4 8x9mm 3140 45														
	2 KB MWB 4 8x9mm 3140 45 3 4														
3 4 INITIAL CALIBRATION CALIBRATION CHECKS															
DATE:	- 4														
TIME:			0809	1436											
	ECTOR NTATIC		.050" Notch	.050" Notch											
	AMPLIT	UDE	80%/0db	80%/-2d	<u>,                                    </u>		*								
CH. 1	LOCATI	ON	1.414"	1.407"											
CH. 2	AMPLIT	UDE	80%/0db	80%/-2d	b										
011.2	LOCATION	ON	1.414"	1.399"											
CH. 3	AMPLIT	UDE							•						
010	LOCATI	ON													
CH. 4	AMPLIT	UDE							<u> </u>						
	LOCATI	ON													
EXAM			WHN	WHN											
Remai CAL	rks: P4														
Exami	iner: V	1/1	Nelson		Examine	er:				Reviewe					
Level:	111	Date	<u>,v</u>	05	Level: _	Dat	e:						8/23/05		

	AL		IATED UI CALIBRA			-SCAN			Job#	04	-41		Riser #	‡ 26	3
Location	n: 20(	0 EAS	T TANK F	ARM	Systen	n: 104-/	NΑ		ibration Block:	444-	99-30	)-00	1/002		
Procedu	ure:	OGE	MA SVUT	INS-007.	3	Rev.	2	Thi	ckness:	1.	0"	М	aterial:	Carb	on Steel
UT Syst	tem:	F	PSP-4	Serial N	lo.	206			erence Block:	•		<del></del>	N/A		
Softwar	e Vers	sion:	P-SCAN	Sys. 4 1	.3	Rev.	2	Thi	ckness:	N/	A	M	aterial:		N/A
Linearity	y Due	Date:	10/30	/2005				Ref	ference	Block Te	emp:	A۱۸	∕B °F		
Scanne	г Туре	); 	AWS-5d	Serial N	10. 30!	9		Cot	uplant:	Wat	er	В	atch No.		N/A
Scanne	r Cabl	le:	COAXIAL					Cal	ble Leng	jth:	8	0 F	eet		
Signal C	Cable:		COAXIAL	•				Cal	ble Leng	jth:	8	0 F	eet		
Chann	Channel Transducer Model Freq. Size Serial No. Angle (deg) Wedge Type  1 KB MWB 4 8x9mm 3132 45														
1	Channel         Make         Model         (MHz)         Size         Serial No.         Nom. / Act.         Type           1         KB         MWB         4         8x9mm         3132         45           2         KB         MWB         4         8x9mm         03333         45														
1 KB MWB 4 8x9mm 3132 45 2 KB MWB 4 8x9mm 03333 45 3															
	2 KB MWB 4 8x9mm 03333 45														
	3														
		CALIBI	<del>_</del>						RATIO	N CHE	CKS			т	
DATE:			08/01/05	08/01/05	08/	02/05	08/02/	05							
TIME:			0717	1540	0	645	1447	<u> </u>					<u> </u>		· · · · · · · · · · · · · · · · · · ·
REFLE ORIEN			.050" Notch	.050" Notch		otch	.050' Notel								
CH. 1	AMPL	ITUDE	80%/0db	80%/1db	809	%/0db	80%/2	db							
C,1. 1	LOCA	TION	1.414"	1.400"	1.	414"	1.403	M							
CH. 2	AMPL	ITUDE	80%/0db	80%/1db	809	%/0db	80%/0	db						T	
Un. 2	LOCA	TION	1.414"	1.406"	1.	414"	1.413	**							
011.2	AMPL	MUDE													
CH. 3	LOCA	TION													
611.4	AMPL	ITUDE													
CH. 4	LOCA	TION													
EXAM	INER	) <del>:</del>	WDP	WDP	V	VDP	WDF	,						T.	
Remai CAL	rks: P5			•!	<u>'</u>	· ! ·		·						<u></u>	
Exami	iner:	W. P:	Purdy		Examine	er:				Re	viewe	r: W	/. H. Nel		·····
<u> </u>	<u>ن</u>	10 t	Tuel	- ـــلم						_  4	H		elm		
Level: P-So		Date imited	e: 8/1&2	) <b>(</b> 30 <b>)</b>	_evel: _	Da	te:			Le	vel: <u>1</u>	11	Date:	8/23	3/05

AUTOMATED ULTRASONIC P-SCAN CALIBRATION SHEET							Job# 04-41				Riser# 26				
Location: 200 EAST TANK FARM					Syster	n: 104- <i>/</i>	١N		ibration Block:	44	4-99-3	0-00	1/002		-
Procedure: COGEMA SVUT-IN					'.3	Rev.	Rev. 2		Thickness:		· · · · · · · · · · · · · · · · · · ·		Material: Carbon Stee		bon Steel
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### **JBNDT**

P.O. Box 360 Jackson, SC. 29831 706.829.1245 email: jbndt @ yahoo.com

August 22, 2005

COGEMA Engineering Corp. 2425 Stevens Center Richland, WA. 99352

This letter is to certify that I have reviewed the P-scan automated ultrasonic data from Hanford waste tank 241-AN-104. The data was collected by Mr. Nelson and Mr. Purdy June 23rd. through August 3rd. 2005. The data is acceptable. The data from the vertical walls, vertical welds, horizontal weld, bottom knuckle of the primary wall, liquid to air interface and slots was analyzed to the requirements of COGEMA procedure SVUT-INS-007.3 Revision 2.

There are no reportable indications. No cracking, reportable pitting or thinning was detected in any of the areas examined.

James B. Elder

ASNT ACCP UT Level III Certificate # 15358

JBNDT, PO Box 360 Jackson, SC. 29831, jbndt@yahoo.com

CC: Mr. W. H. Nelson - COGEMA

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## **ATTACHMENT 3**

## ULTRASONIC EXAMINATION OF DOUBLE-SHELL TANK 241-AN-104 EXAMINATION COMPLETED <u>AUGUST 2005</u> (PNNL THIRD PARTY REVIEW)

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# Ultrasonic Examination of Double-Shell Tank 241-AN-104 Examination Completed <u>August 2005</u>

AF Pardini GJ Posakony

September 2005

Prepared for the U.S. Department of Energy under Contract DE-AC05-76RL01830

Pacific Northwest National Laboratory Richland, Washington 99352

## **Summary**

COGEMA Engineering Corporation (COGEMA), under a contract from CH2M Hill Hanford Group (CH2M Hill), has performed an ultrasonic examination of selected portions of Double-Shell Tank 241-AN-104. The purpose of this examination was to provide information that could be used to evaluate the integrity of the wall of the primary tank. The requirements for the ultrasonic examination of Tank 241-AN-104 were to detect, characterize (identify, size, and locate), and record measurements made of any wall thinning, pitting, or cracks that might be present in the wall of the primary tank. Any measurements that exceed the requirements set forth in the Engineering Task Plan (ETP), RPP-22571 (Jensen 2004) and summarized on page 1 of this document, are reported to CH2M Hill and the Pacific Northwest National Laboratory (PNNL) for further evaluation. Under the contract with CH2M Hill, all data is to be recorded on disk and paper copies of all measurements are provided to PNNL for third-party evaluation. PNNL is responsible for preparing a report(s) that describes the results of the COGEMA ultrasonic examinations.

### **Examination Results**

The results of the examination of Tank 241-AN-104 have been evaluated by PNNL personnel. The ultrasonic examination consisted of two 15-in. wide (on some plates the scan was 17-in. wide) scan paths over the entire height of the tank and the heat-affected zone (HAZ) of four vertical welds and one horizontal weld. The examination also included one horizontal scan path in the liquid/air interface region on Plate #1, examination of the upper portion of the knuckle region, and 4 areas of the lower portion of the knuckle in the air slots. The examination was performed to detect any wall thinning, pitting, or cracking in the primary tank wall.

## **Primary Tank Wall Vertical Scan Paths**

Two 15-in.-wide (on some plates the scan was 17-in. wide) vertical scan paths were performed on Plates #1, #2, #3, #4, and #5. The plates were examined for wall thinning, pitting, and cracks oriented vertically on the primary tank wall. There were no areas of wall thinning that exceeded the reportable level of 10% of the nominal thickness. No pitting or vertical crack-like indications were detected in Plates #1, #2, #3, #4, or #5.

### Primary Tank Wall Weld Scan Paths

The HAZ of vertical welds in Plates #2, #3, #4, and #5 were examined for wall thinning, pitting, and cracks oriented either perpendicular or parallel to the weld. There were no areas of wall thinning that exceeded the reportable level of 10% of the nominal thickness. No pitting or crack-like indications were detected in the weld HAZ areas in Plates #2, #3, #4, and #5.

The HAZ of the horizontal weld between Plate #5 and the tank knuckle was examined for wall thinning, pitting and cracks oriented either perpendicular or parallel to the weld. There were no areas of wall thinning that exceeded the reportable level of 10% of the nominal thickness. No pitting or crack-like indications were detected in the weld HAZ areas on Plate #5 side or on the knuckle side of the horizontal weld.

#### Primary Tank Wall Liquid/Air Interface Horizontal Scan Paths

One 17-in.-wide horizontal scan path was performed on Plate #1. The plate was examined for wall thinning on the primary tank wall. There were no areas of wall thinning that exceeded the reportable level of 10% of the nominal thickness.

#### Primary Tank Wall Knuckle Scan Paths

The upper portion of the knuckle area was scanned utilizing the Y-arm scanner attached to the AWS-5D crawler. The Y-arm scanned the transducers down around the knuckle approximately 12-in. (from a starting position 2-in. down) from the upper knuckle weld joining Plate #5 to the knuckle. The knuckle was examined for wall thinning, pitting, and cracks oriented circumferentially around the primary tank. There were no areas that exceeded the reportable level of 10% of the nominal thickness. No pitting or circumferentially oriented crack-like indications were detected in the upper portion of the knuckle area.

Four small areas on the lower portion of the knuckle area were examined for wall thinning only utilizing the Y-arm scanner in areas accessible through selected air slots. The four areas examined were in air slots designated as Slot2, Slot 7, Slot 8, and Slot 9. There were no areas that exceeded the reportable level of 10% of the nominal thickness.

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## 1.0 Introduction

COGEMA Engineering Corporation (COGEMA), under a contract from CH2M Hill Hanford Group (CH2M Hill), has performed an ultrasonic examination (UT) of selected portions of Double-Shell Tank (DST) 241-AN-104. The purpose of this examination was to provide information that could be used to evaluate the integrity of the DST. The requirements for the UT of Tank 241-AN-104 were to detect, characterize (identify, size, and locate), and record measurements made of any wall thinning, pitting, or cracks that might be present in the wall of the primary tank. Any measurements that exceed the requirements set forth in the Engineering Task Plan (ETP), RPP-22571 (Jensen 2004), are reported to CH2M Hill and the Pacific Northwest National Laboratory (PNNL) for further evaluation. Specific measurements that are reported include the following:

- Wall thinning that exceeds 10% of the nominal thickness of the plate.
- Pits with depths that exceed 25% of the nominal plate thickness.
- Stress-corrosion cracks that exceed 0.10 in. (through-wall) and are detected in the inner wall of the tank, HAZ of welds, or in the tank knuckle.

The accuracy requirements for ultrasonic measurements for the different types of defects are as follows:

- Wall thinning measure thickness within ±0.020 in.
- Pits size depths within ±0.050 in.
- Cracks size the depth of cracks on the inner wall surfaces within  $\pm 0.1$  in.
- Location locate all reportable indications within  $\pm 1.0$  in.

Under the contract with CH2M Hill, all data is to be recorded on disk and paper copies of all measurements are provided to PNNL for third-party evaluation. PNNL is responsible for preparing a report(s) that describes the results of the COGEMA UT.

# 2.0 Qualified Personnel, Procedures, and Equipment

Under contract from CH2M Hill, qualification of personnel participating in the DST inspection program, the UT equipment (instrument and mechanical scanning fixture), and the UT procedure that will be used in the examination of the current DST is required. Personnel participating in the examinations are to be certified in accordance with American Society for Nondestructive Testing (ASNT) Recommended Practice SNT-TC-1A, 1992 Edition, and associated documentation is to be provided. The capability of the UT system is to be validated through a performance demonstration test (PDT) on a mock-up simulating the actual DST. The current procedure for the UT is to be based on requirements listed in the American Society for Mechanical Engineers (ASME), Boiler and Pressure Vessel Code Section V, Article 4, *Ultrasonic Examination Methods for Inservice Inspection*.

### 2.1 Personnel Qualifications

The following individuals were qualified and certified to perform UT of the Hanford DST 241-AN-104:

- Mr. Wesley Nelson, ASNT Level III (#LM-1874) in UT, has been identified as COGEMA's UT
  Level III authority for this project. Mr. Nelson has been certified by COGEMA as a UT Level III in
  accordance with COGEMA procedure COGEMA-SVCP-PRC-014, latest revision. Further
  documentation has been provided to establish his qualifications. Reference: Letter from PNNL to
  C.E. Jensen dated August 22, 2000, "Report on Performance Demonstration Test PDT, May 2000."
- Mr. James B. Elder, ASNT Level III (#JM-1891) in UT, has been contracted by COGEMA to provide peer review of all DST UT data. Mr. Elder has been certified by JBNDT as a UT Level III in accordance with JBNDT written practice JBNDT-WP-1, latest revision. Further documentation has been provided to establish his qualifications. Reference: PNNL-11971, Final Report Ultrasonic Examination of Double-Shell Tank 241-AN-107.
- Mr. William D. Purdy, COGEMA UT Level II limited (for P-Scan data acquisition only).
   Mr. Purdy has been certified in accordance with COGEMA procedure COGEMA-SVCP-PRC-014, latest revision. Further documentation has been provided to establish his qualifications. Reference: Letter from PNNL to C.E. Jensen dated October 5, 2001, "Purdy Performance Demonstration Test (PDT) Report."

### 2.2 Ultrasonic Examination Equipment

CH2M Hill has provided the UT equipment for the examination of Tank 241-AN-104. This equipment consists of a Force Institute P-Scan ultrasonic test instrument and a Force Institute AWS-5D and AGS-2 remote-controlled, magnetic-wheel crawlers for examining the primary tank wall. Ultrasonic transducers used for the examinations are commercial off the shelf. The P-Scan ultrasonic system and Y-arm scanner attachment have been qualified through a PDT administered by PNNL. Reference: PNNL-11971, Final Report- Ultrasonic Examination of Double-Shell Tank 241-AN-107 and letter from PNNL to C.E. Jensen dated September 21, 2001, "Qualification of the Y-Arm Attachment".

#### 2.3 Ultrasonic Examination Procedure

COGEMA-SVUT-INS-007.3, Revision 2, outlines the type of UT and mechanical equipment that are to be used as well as the types of transducers. Both straight-beam and angle-beam transducers are used for the examination of the primary tank wall. The examination procedures include full documentation on methods for calibration, examination, and reporting. Hard copies of the T-Scan (thickness) and P-Scan (projection or angle beam) views of all areas scanned are made available for analysis. The UT procedure requires the use of specific UT transducers for the different examinations. A calibration performed before and after the examinations identifies the specific transducers used and the sensitivity adjustments needed to perform the inspection. The COGEMA UT procedure has been qualified through a Performance Demonstration Test. Reference: PNNL-11971, Final Report - Ultrasonic Examination of Double-Shell Tank 241-AN-107.

# 3.0 Ultrasonic Examination Configuration

COGEMA is required to inspect selected portions of the DSTs which may include the primary and secondary tank walls, the HAZ of the primary tank vertical and horizontal welds, and the tank knuckle and bottoms. The P-Scan system has been configured to perform these examinations and has been performance tested. The examination of Tank 241-AN-104 included UT of the primary tank wall, the HAZ of selected welds in the primary tank wall, the upper portion of the knuckle extending axially downward from the upper knuckle weld approximately 12-in., and selected portions of the knuckle in the air slot openings that extended to the lower knuckle weld.

## 3.1 Primary Tank Wall Transducer Configuration

Figure 3.1 provides an example of the scanning configuration generally used during an examination of the primary tank wall. However, other configurations can be used at the discretion of the COGEMA UT Level III (i.e., 45-degree transducers can be removed for simple wall thickness measurements). The functional diagram in Figure 3.1 shows one straight-beam and two angle-beam transducers ganged together for examining the primary tank wall. The straight beam is designed to detect and record wall thinning and pits, and the angle beams are designed to detect and record any cracking that may be present. These transducers are attached to the scanning bridge and they all move together. Information is captured every 0.035-in. (or as set by the NDE inspector) as the assembly is scanned across a line. At the end of each scan the fixture is indexed 0.035-in. (or as set by the NDE inspector) and the scan is repeated. The mechanical scanning fixture is designed to scan a maximum of 15-in. (new scanner can scan 17-in.) and then index for the next scan. The hard copy provides a permanent record that is used for the subsequent analysis.

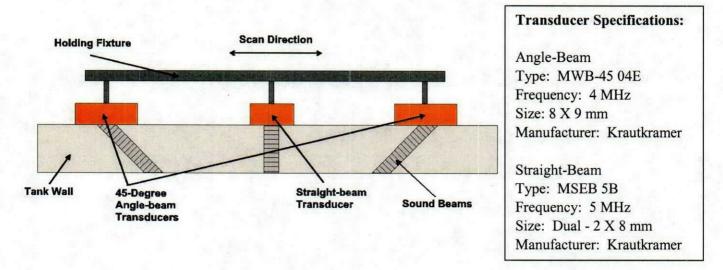


Figure 3.1. Transducer Configuration for Examining the Primary Tank Wall

### 3.2 Weld Zone Transducer Configuration

Figure 3.2 is a functional sketch that shows the configurations for examination of the weld zone. The area of interest (HAZ of the weld) is shown as lying adjacent to the weld. Both cracks and pitting may occur in this region. The "A" portion of this sketch shows the 60-degree angle-beam transducers used for detecting cracks parallel to the weld. The straight-beam transducers in this sketch are used for detecting and recording any pitting or wall thinning that may be present. All transducers are ganged together. The scanning distance traveled is limited to a total of approximately 5.0-in. The sketch titled "B" shows the arrangement for detecting cracks that may lie perpendicular to the weld. Four 45-degree, angle-beam transducers are used for this inspection. Again the transducers are ganged together but the scan is limited to a total of approximately 4.0-in. The weld zone requirements are shown in Figure 3.3. The scan protocol, data capture, and index are the same for examining other weld areas in the tank.

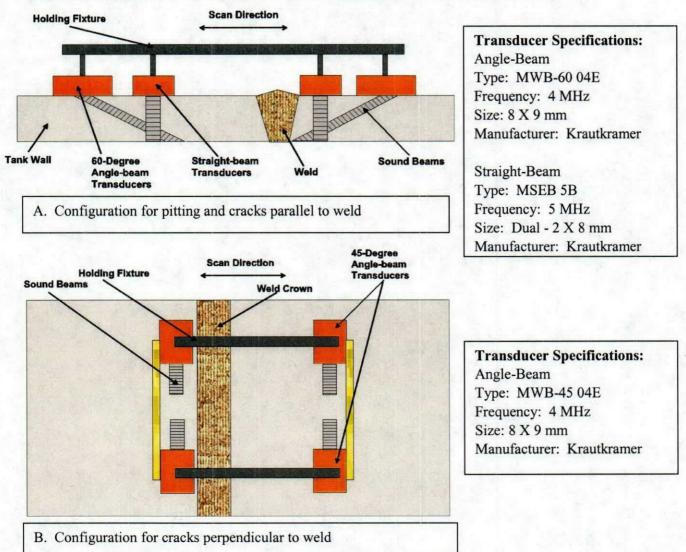
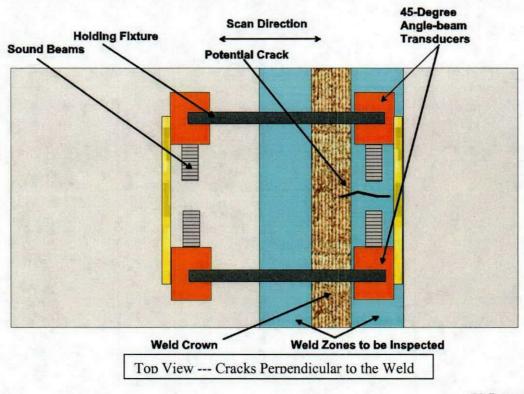
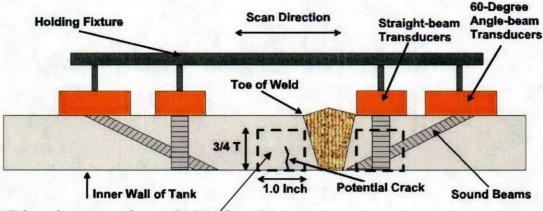


Figure 3.2. Transducer Configurations for Examination of Weld Zone in the Primary Tank Wall

In the HAZ, the requirement for characterizing cracks that lie perpendicular or parallel to welds in the primary tank wall is described in Figure 3.3. The HAZs are located on either side of the weld and defined as being within 1-in. of the toe of the weld and on the inner three-quarters of the thickness (3/4T) of the plate. These zones are considered most likely to experience stress-corrosion cracking.





A zone ¾ T from the inner surface and 1.0-in. from the toe of the weld is to be ultrasonically examined for cracking, corrosion or pitting. Examinations are to be made on both sides of the weld.

End View --- Cracks Parallel to the Weld

Figure 3.3. Views of the Weld Zone to be Ultrasonically Examined in the Primary Tank Wall

### 3.3 Knuckle Area Transducer Configuration

Examination of the knuckle utilizes a modified scanning bridge known as the Y-arm scanner. The Y-arm provides scanning of the transducers directly on the knuckle region. The Y-arm is a special fixture that attaches to the AWS-5D magnetic wheel crawler. Its purpose is to extend the reach of the transducer assembly. This extension allows the transducer assembly to follow the curve of the upper portion of the knuckle below the transition Plate #5 to upper knuckle weld. It is designed to hold the dual 0-degree or two 45-degree transducers in the same configuration as used for the examination of the tank wall. The transducer configuration used for crack detection in this examination was two opposing 45-degree angle-beam transducers that were rotated 90-degrees from the orientation used for the wall crack inspection. This configuration is designed to detect cracks that are in a circumferential direction with respect to the axis of the tank. Figure 3.4 is a sketch showing the area of the section of the knuckle examined using the Y-arm fixture. With the transducer positioned 2-in. below the transition Plate #5 to upper knuckle weld, the scanning bridge was set to scan the transducer downward an additional distance of approximately 12-in. in 0.035-in steps (or as set by the operator). Upon completion of the scan, the bridge was indexed circumferentially 0.035-in. (or as set by the operator) and the scan downward is repeated to obtain a pixel size 0.035-in. x 0.035-in. (or as set by the operator).

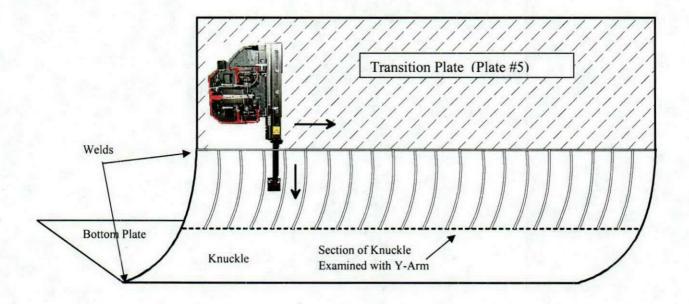


Figure 3.4. Sketch of a Section of the Knuckle Examined with the Y-Arm Scanner

Additional Y-arm scanning was done on areas that were accessible in the air slots that extend under the tank in the concrete support foundation. Figure 3.5 provides an end view (looking down the air slot) and Figure 3.6 provides a side view (looking along the circumference of the tank) of the examination of the lower knuckle in the region of the air slots.

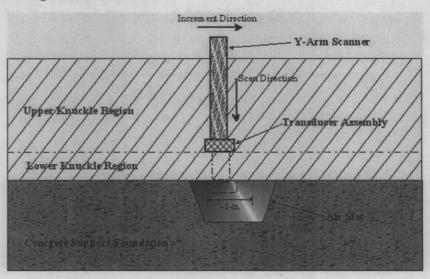


Figure 3.5. Lower Knuckle Examination in Air Slot Regions (End View)

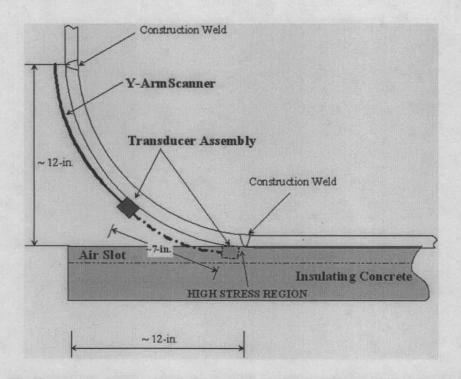
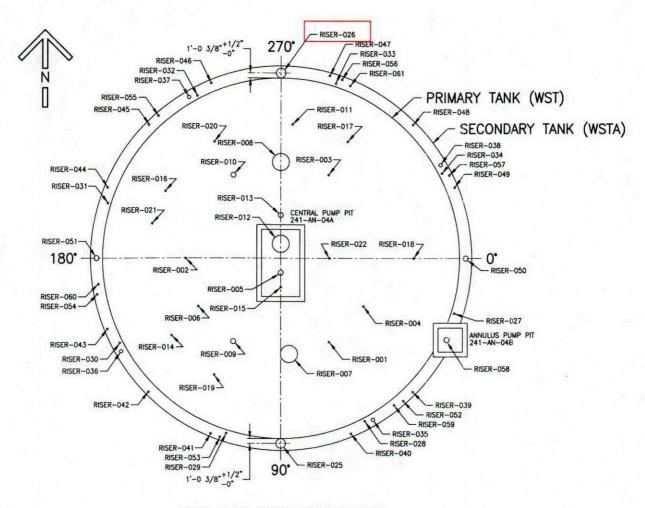


Figure 3.6. Lower Knuckle Examination in Air Slot Regions (Side View)

# 4.0 Ultrasonic Examination Location

Tank 241-AN-104 is located in the Hanford 200 East area in AN Tank Farm. The crawler and associated scanner were lowered into the 24-in. riser located on the north side of 241-AN-104 and designated as Riser 26. Figure 4.1 provides a graphic of the location of this riser.



PLAN VIEW TANK 241-AN-104

Figure 4.1. UT of 241-AN-104 Riser 26

9 Att. 3-16 Figure 4.2 describes the areas on the primary wall of Tank 241-AN-104 that were ultrasonically examined. Two 15-in.-wide (on some plates the scan was 17-in. wide) vertical scan paths were performed on Plates #1, #2, #3, #4, and #5 below the entrance to Riser 26. Vertical weld HAZ examinations were done on Plates #2, #3, #4, and #5, and the horizontal weld HAZ examination was done on the transition Plate #5 to knuckle weld. One additional horizontal scan path was performed in the liquid/air interface region on Plate #1, examination of the upper portion of the knuckle region, and 4 areas of the lower portion of the knuckle in the air slots.

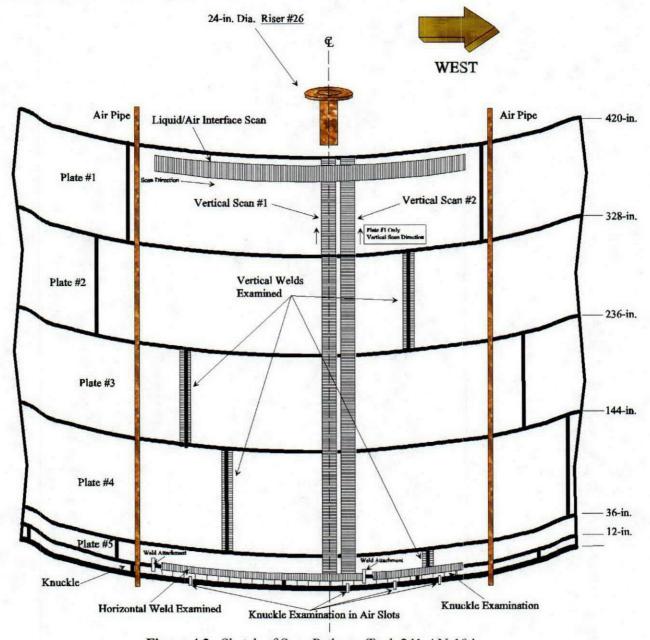


Figure 4.2. Sketch of Scan Paths on Tank 241-AN-104

#### 5.0 Ultrasonic Examination Results

COGEMA has provided detailed reports including T-Scan and P-Scan hard copies of all areas that were ultrasonically examined to PNNL for third-party review. The data was analyzed by COGEMA Level III Mr. Wes Nelson, and peer reviewed JBNDT Level III Mr. Jim Elder. The results of the examination of Tank 241-AN-104 are presented in Figures 5.1, 5.2, and 5.3.

Figures 5.1 and 5.2 show the wall thickness examination results for the primary tank wall and the HAZs of both vertical and horizontal welds. The examination consisted of two vertical paths beneath the 24-in. diameter riser. Vertical scan #1 was 15-in. wide (on some plates the scan was 17-in, wide) on Plate #1, #2, #3, #4, and #5 near the centerline of the 24-in. riser. Vertical scan #2 was adjacent to vertical scan #1 and was also 15-in. wide (on some plates the scan was 17-in. wide) on Plate #1, #2, #3, #4, and #5. Vertical scans on Plate #1 were done in the upward direction due to modifications made to the crawler cable attachment. All other plates were done in the downward direction. The HAZs of vertical welds in Plates #2, #3, #4, and #5 were examined and the HAZ in the horizontal weld between Plate #5 and the knuckle section was also examined. Weld area exams include approximately 5-in. on each side of the weld. One 17-in. wide horizontal scan path on Plate #1 was performed in the liquid/air interface region. Areas in the figures that show two measurements in the same box are the result of the vertical scan paths overlapping the horizontal scan paths. Figures 5.1 and 5.2 display the minimum readings taken in each 15-in. (17-in. for some plates and the liquid/air interface horizontal scans) wide by 12-in. long area of the scan. In the overlapping areas, both minimum readings from each vertical and horizontal scan paths are given. Two areas on the horizontal weld examination had a weld attachment that limited data acquisition.

Figure 5.3 shows the examination performed on the knuckle of the primary tank wall. The readings distributed around the circumference of the tank knuckle represent the minimum reading in each 12-in. long by 12-in. wide portion extending down around the upper portion of the knuckle. The four areas denoted as Slot 2, Slot 7, Slot 8, and Slot 9, represent small areas that were scanned extending down to the lower portion of the knuckle in the air slots. These scan areas are approximately 1-in. long (increment direction around the circumference of the tank), and 7-in wide (scan direction is down around the knuckle and into the air slot) as shown previously in Section 3 of this report.

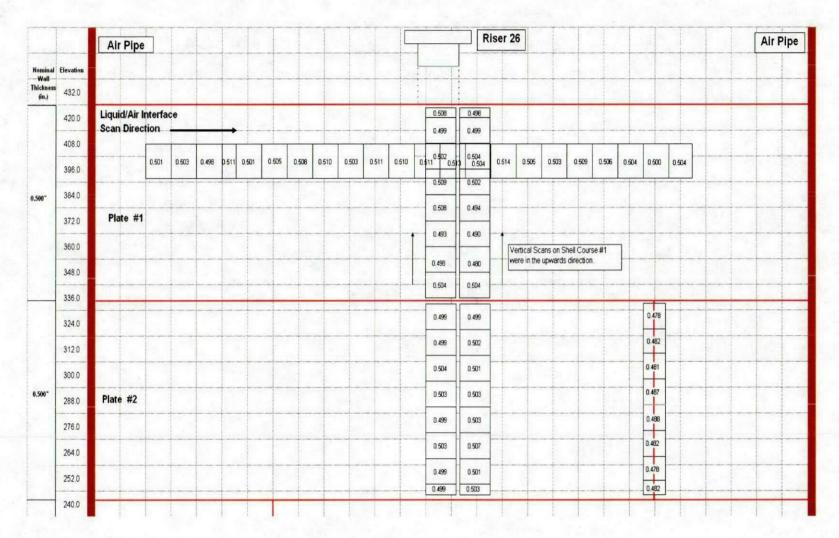


Figure 5.1. UT Data from Tank 241-AN-104

12 tt. 3-19

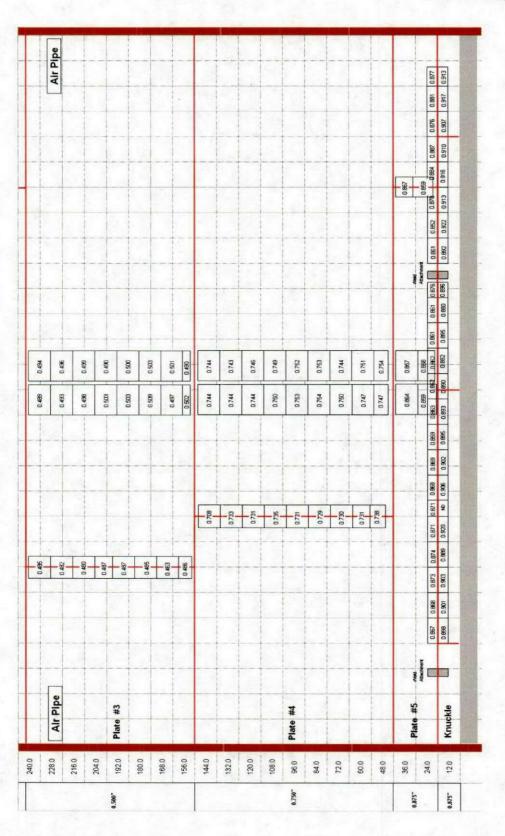


Figure 5.2. UT Data from Tank 241-AN-104 cont.

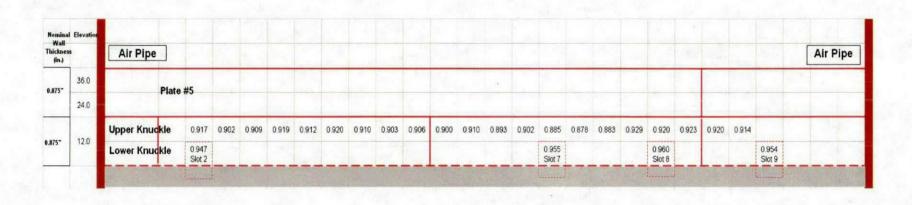


Figure 5.3. UT Data from Tank 241-AN-104 cont.

#### 6.0 Conclusions

The results of the examination of Tank 241-AN-104 have been evaluated by PNNL personnel. The examination consisted of two 15-in, wide (on some plates the scan was 17-in, wide) scans over the entire height of the tank and the HAZs of 4 vertical welds and 1 horizontal weld. The examination also included one 17-in, wide horizontal scan in the liquid/air interface region on Plate #1, examination of the upper portion of the knuckle region, and 4 areas of the lower portion of the knuckle in the air slots. The examination was performed to detect any wall thinning, pitting, or cracking in the primary tank wall.

### 6.1 Primary Tank Wall Vertical Scan Paths

Two 15-in.-wide (on some plates the scan was 17-in. wide) scan paths were performed on Plates #1, #2, #3, #4, and #5. The plates were examined for wall thinning, pitting, and cracks oriented vertically on the primary tank wall. The results indicated that the minimum thicknesses in the areas scanned with nominal thickness of 0.500-in. were as follows; Plate #1 was 0.480-in., Plate #2 was 0.499-in., and Plate #3 was 0.489-in. The nominal thickness in Plate #4 is 0.750-in. and the minimum thickness in this area was 0.743-in. The nominal thickness in Plate #5 is 0.875-in. and the minimum thickness in this area was 0.857-in. There were no areas of wall thinning that exceeded the reportable level of 10% of the nominal thickness. No pitting or vertical crack-like indications were detected in Plates #1, #2, #3, #4, or #5.

### 6.2 Primary Tank Wall Weld Scan Paths

The HAZ of vertical welds in Plates #2, #3, #4, and #5 were examined for wall thinning, pitting and cracks oriented either perpendicular or parallel to the weld. The results indicated that the minimum thicknesses in the weld areas scanned were as follows: The nominal thickness of Plate #2 is 0.500-in. and the minimum thickness in this weld area was 0.478-in. The nominal thickness in Plate #3 is 0.500-in. and the minimum thickness in this weld area was 0.463-in. The nominal thickness in Plate #4 is 0.750-in. and the minimum thickness in this weld area was 0.708-in. The nominal thickness in Plate #5 is 0.875-in. and the minimum thickness in this weld area was 0.859-in. There were no areas of wall thinning that exceeded the reportable level of 10% of the nominal thickness. No pitting or crack-like indications were detected in the weld areas in Plates #2, #3, #4, and #5.

The HAZ of the horizontal weld between Plate #5 and the tank knuckle was examined for wall thinning, pitting and cracks oriented either perpendicular or parallel to the weld. The results indicated that the minimum thickness in the weld area with nominal thickness of 0.875-in. on Plate #5 was 0.852-in. The minimum thickness in the weld area with nominal thickness of 0.875-in. on the knuckle was 0.880-in. There were no areas of wall thinning that exceeded the reportable level of 10% of the nominal thickness. No pitting or crack-like indications were detected in the weld areas on Plate #5 side or on the knuckle side of the horizontal weld.

### 6.3 Primary Tank Wall Liquid/Air Interface Horizontal Scan Paths

One 17-in.-wide horizontal scan path was performed on Plate #1. The plate was examined for wall thinning on the primary tank wall. The results indicated that the minimum thickness in the areas scanned on Plate #1 with nominal thickness of 0.500-in. was 0.498-in. There were no areas of wall thinning that exceeded the reportable level of 10% of the nominal thickness.

### 6.4 Primary Tank Wall Knuckle Scan Paths

The upper portion of the knuckle area was scanned utilizing the Y-arm scanner attached to the AWS-5D crawler. The Y-arm scanned the transducers down around the knuckle approximately 12-in. (from a starting position 2-in. down) from the upper knuckle weld joining Plate #5 to the knuckle. The knuckle was examined for wall thinning, pitting, and cracks oriented circumferentially around the primary tank. The results indicated that the minimum thickness in the approximately 20 circumferential feet of knuckle area examined with nominal thickness of 0.875-in. was 0.878-in. There were no areas that exceeded the reportable level of 10% of the nominal thickness. No pitting or circumferentially oriented crack-like indications were detected in the upper portion of the knuckle area.

Four small areas on the lower portion of the knuckle area were examined for wall thinning only utilizing the Y-arm scanner in areas accessible through selected air slots. The four areas examined were in air slots designated as Slot 2, Slot 7, Slot 8, and Slot 9. The results indicated that the minimum thickness in the lower portion of the knuckle area, with nominal thickness of 0.875-in., in the selected air slots was 0.947-in. There were no areas that exceeded the reportable level of 10% of the nominal thickness.

### 7.0 References

Jensen, C. E., 2004, Engineering Task Plan for the Ultrasonic Inspection of Hanford Double-Shell Tanks FY2005, RPP-22571, Rev 0, September 2004, CH2M Hill Hanford Group, Inc., Richland, Washington.

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